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GENERAL NEWS SECTION 28

THE Interstate Commerce Commission has approved the California three-dollar demurrage rate for freight cars carrying interstate shipments, as noted in another column of this issue, and this is good news; but the approval appears to have been given with some reluctance. The railways have, indeed, "abundantly sustained" their claim that the high demurrage rate now imposed on intrastate freight is a benefit to the public, and it would have been impossible to maintain any rational argument for the continuance of the one-dollar rate; but Commissioner Lane slightly qualifies his approval of the decision, and Chairman Prouty dissents from it. Mr. Lane attributes the good conditions in California not to the rate but to Mr. Mote's efficient management of the demurrage bureau. What kind of instrument or weapon Mr. Mote could have used if he had not had available the money penalty is not clear, at this distance; but no one will quarrel with Mr. Lane on that point. Mr. Prouty objects to disturbing the uniform rate ($1) even on "the extreme edge" of the territory. His main argument is that, though exceptions are to be recognized, one dollar a day is, on the whole, sufficient. But there is one big exception that he overlooks; periods of widespread congestion, such as now prevails. In dull times a dollar a day is sufficient; and where track room is plenty and switching complexities are not burdensome even a smaller sum might be fair, were it not for the dilatory habits which such practice would encourage. But when cars are in urgent demand everywhere a charge of three dollars a day for a freight car is not too high; it is in many cases too low. The Canadian Railway Commission has done a good thing in giving emphasis to the feasibility of making demurrage rates higher at one season than at another.

A CORRESPONDENT, whose letter is published in another column, takes issue with our statement made in commenting on The New Haven Monopoly that "in the West . . . the movement for regulation of railways was born," and points to the fact that the Massachusetts railroad commission was created in 1869. That is true. And there was a railroad commission in Maine in 1857, and very early in one or two other states; but nevertheless the first active agitation for the regulation of railroads was the granger movement in the West in 1875-9. Our correspondent finds fault with the Massachusetts commission for not having more effectively "regulated" railroads. There is no gainsaying the fact that the Massachusetts commission has been a conservative commission, ever since it has been given the power to *order* a reduction in rates; but we can hardly agree with our correspondent that it has not been an effective and generally an efficient regulative body. The ideal aimed at in appointments to this state commission has been to have one "business man," one railroad man and one lawyer or economist; and it has had on it many strong men whose probity and judgment could be trusted. The system of radical versus mild regulation is too complicated a question to go into here, but the principles of representative government rest on the election of public spirited governors who will appoint, as they have done in Massachusetts, public spirited men to carry out their policies. When the Hadley Securities Commission was making its exhaustive study of the past experiences of railroad regulation in this country, the acts and methods of the Massachusetts commission were cited by men of widely varying opinion, but with almost unvarying respect. Of course, this inquiry was primarily on the question of the regulation of the issue of securities by railroad companies, and Massachusetts is one of the few states that has carried out for a number of years a consistent policy of regulation. The point that Mr. Carter makes in regard to the ineffectiveness of radical laws if unenforced by public opinion is a good one, but the implication that he makes that the Massachusetts railroad commission has failed in its duty, because it has not found it necessary to exercise all of the powers given it by law, we should hesitate to agree with.

THE problem of fuel economy has been given close attention on European railways, and especially in Germany, as indicated by the article by H. W. Jacobs in this issue. Two things are largely responsible for this—the high price of fuel and the relatively low cost of labor as compared to conditions in America. The question of fuel economy is being given more and more attention in this country, and several roads now have departments whose entire energies are given over to the promotion of the more efficient use of fuel. Splendid results have been obtained by closer inspection of the coal at the mines, by studying and re-arranging its distribution, by improving coaling facilities, by using more care in designing locomotives and equipping them, and by educating the enginemen to the proper use of the fuel. It is interesting to note, however, that some of the

most important improvements in fuel economy have resulted not so much from the desire to save or conserve the fuel as to accomplish other objects. For instance, superheaters were first introduced on switching locomotives not so much to save fuel as to reduce the smoke nuisance. Superheaters, brick arches and other devices are being introduced rapidly and extensively on both passenger and freight power, not so much because of the fuel saving which results from their use as from the fact that the resulting improvement in the steaming capacity of the boiler makes it possible to get the trains over the road on time, or to haul heavier trains in the same time. Steaming capacity of a locomotive boiler has been likened to the lung capacity of an athlete, and the greater steaming capacity made available by the above means makes possible higher sustained speeds, or greater hauling capacity. The human factor is a most important item in the efficient firing of a locomotive, and the great problem has been to educate the enginemen to the proper use of the fuel. One thing that has helped to secure the co-operation of the enginemen has been not so much the interest or desire to save money for the company as the fact that the more intelligent use of fuel has greatly reduced the physical exertion required of the fireman. It might be well to emphasize this feature even more than it has been, in order to encourage and stimulate the fireman to still greater effort—and that of a mental rather than a physical nature.

EVER since James J. Hill called attention about five years ago to the necessity for large expenditures for increased railway facilities, and especially for terminals, this subject has been given much attention by the public generally, and by railway men in particular. Mr. Hill's recent address before the Railway Business Association on the same subject serves to again call attention to this condition and to emphasize its importance. In this connection it is worth while to consider the possibility of increasing the capacity of existing terminals by making careful studies of the methods of operation and observing the influence of the types of engines, number of riders and methods of returning them in hump yards, location of scales, lengths of track, etc. When designing a new terminal much time is devoted to a study of operating conditions and to the development of plans to meet those conditions. With the completion of the yard these studies usually stop until extensive improvements and additions are again necessary. That marked improvements can frequently be made in the operation of existing facilities will be evident from the following instances. While studying the economies of a proposed cutoff a few years ago, one eastern road found that the old line was not being operated to the best advantage, and important readjustments of pusher limits and tonnage ratings were made which affected very material economies without any expenditure. In another instance the operating department complained about the poor results that were being secured from the operation of a recently completed hump yard, and the men in charge of its design were called upon to investigate. After a careful study it was found that the principal difficulty arose from the use of light engines which did not have sufficient power to handle entire trains. The use of old engines for yard work, which are too light and in too poor condition for road service, is common and seriously decreases the efficiency of yard operation, especially during busy seasons when slight delays may cause serious congestion. While instances such as the above are by no means common, they are to be found often enough to warrant a study of old yards at intervals to see if the best results are being obtained. It is seldom possible to enlarge a terminal as soon as it becomes congested, for usually the demands for improvements elsewhere on the system are such that it must continue to be operated under unfavorable conditions for some time. It is not unusual for a careful study of the operating conditions similar to that made when designing a new yard to reveal opportunities for important improvements and increased capacity with a slight rearrangement of the yard. It also frequently happens that the traffic conditions for which the yard was designed have gradually changed since its construction, increasing the expense of operation, in which case such a study may show that a more or less extensive rearrangement is justified to suit the new conditions.

THE NEED FOR A HIGHER DEMURRAGE RATE.

THE recent action of the Canadian railway commission authorizing the Canadian Pacific, Grand Trunk, Canadian Northern and Michigan Central railways to increase their demurrage rates, contains an important suggestion for railway men and railway regulating authorities in this country as to a means of obtaining relief from shortage of the freight car supply. The order of the Canadian commission permits an advance from $1 per car per day to $2 for the first 24 hours after the expiration of free time and $3 for each succeeding day, effective from December 15, 1912, to March 31, 1913. The Canadian railways had asked for a rate of $2, $3 and $4 for the first, second and third days, respectively, but the $4 rate was not approved by the board.

At the last meeting of the American Association of Demurrage Officers a resolution was unanimously adopted in favor of an increased demurrage rate throughout the United States, and the railways of Michigan have recently submitted to the state railway commission the question of increasing the demurrage rate on interstate traffic. In view of the success that has attended the well known experience with a high demurrage rate in California, the subject seems likely to be brought into greater prominence before next season of heavy traffic. The movement also should be greatly helped by the Interstate Commerce Commission's approval of the California rate, which has just been issued. Beginning January 6, the California roads are free to carry out their plan, proposed early in the year, for an increase in the interstate demurrage rate from $1 to a parity with the state rate, which has been $3 since May 1, 1911, and was $6 from June 19, 1909 to May 1, 1911.

While the purpose of the Canadian commission's order is the same as that of the higher rate in California, viz.: to increase the car movement by eliminating unnecessary detention of cars by shippers and consignees, the fact that it is not to be applicable during the entire year and that it involves the idea of a sliding scale, increasing with the period of detention, would seem to be calculated to make it more acceptable to shippers.

Undoubtedly any effort to increase demurrage rates generally would encounter the opposition of shippers, particularly of those who pay the most demurrage, and who, of course, are those who have not provided themselves with sufficient loading and unloading facilities for handling their business promptly. These constitute the class which a higher demurrage rate is intended to reach and whose opposition is least entitled to consideration, while the general body of shippers can have no reason for protesting against an advance on the grounds that it will increase the revenues of the carriers, because a higher demurrage rate is intended to reduce the amount of demurrage payments by making the rate prohibitive.

Freight car shortages may be due to lack of enough cars to handle promptly the maximum traffic of the country or to failure to obtain the most efficient use of the available supply of equipment. One of the greatest causes of freight car inefficiency is the economic waste of using expensive cars and track room for warehouse purposes. To require the railways to own enough cars in addition to the average requirements of business to enable them to handle promptly the "peak load" of the traffic in addition to allowing many cars to be used as warehouses would involve an economic waste that somebody must make good; and that somebody, in the long run, is the shipping and consuming public. A large surplus of cars throughout the greater part of the year is expensive to own and to maintain, besides increasing the cost of operating the cars in service by clogging side tracks and terminals.

The responsibility for the proper use of equipment must be divided between the carriers and the shippers and any means of increasing efficiency of car service will be of advantage to both.

Many shippers have made praiseworthy efforts to co-operate with the carriers in reducing the effect of the extraordinary pressure upon their facilities during the past few months. They can make the co-operation permanent by assuming a greater responsibility for cars while in their possession.

The demurrage rate has a dual function. It is to be regarded first as compensation to the carrier for the use of the car beyond the time contemplated in the freight rate, and, second, as a penalty to compel the prompt release of equipment in order that it may be available for further transportation service.

A freight car's chief value consists in its movability. To use it as a warehouse when it is required for transportation deprives it of its value, for which a rate of $1 per day is not compensatory during a time of heavy business, for the highest rate ever proposed is less than the earning capacity of a car at such a time. Moreover, the present demurrage rate was adopted at a time when the average capacity of cars was from 10 to 20 tons, while the capacity of cars today ranges from 30 to 50 tons and averages probably 37 tons. The increase in the capacity of equipment has been accompanied by an increase in its cost, so that a car which is detained by a consignor or consignee today represents a materially greater investment to the carrier than the equipment employed 25 years ago, while it also possesses a correspondingly greater earning capacity.

A demurrage charge falls short of its purpose if it fails either to yield the carrier proper compensation for the service which it covers or to accomplish the prompt release of cars and reform of methods. The insufficiency of the present rate in the latter respect has been thoroughly demonstrated. Just so long as it is cheaper for the shippers to pay demurrage than to provide themselves with proper facilities, cars will be kept out of service needlessly in addition to the natural and unnatural delays incident to operation for which the carriers are automatically penalized by a decrease of their earning capacity.

That a high demurrage rate is an effective remedy for car detention has been abundantly proved by the experience in California. E. E. Mote, manager of the Pacific Car Demurrage Bureau, has compiled tables showing comparative results for the period of 32 months from November 1, 1906, to June 30, 1909, when the rate on all traffic was $1, for the period of 22 months from June 30, 1909, to April 30, 1901, when the rate on state traffic was $6 and on interstate traffic $1; and for the period of ten months from May 1, 1911, to February 29, 1912, when the rate on state traffic was $3 and on interstate traffic $1. The number of cars held overtime at all California stations during the first period was 184,172, while the number held overtime during the corresponding time of the second and third periods together, when the higher rates prevailed, was 113,343, a decrease of 38½ per cent., and the number of cars handled during the second and third periods had increased 1,114,192 or 46½ per cent. The percentage of detention during the first period was 7.82 per cent.; during the second period the detention of cars on which the demurrage was $6 was 1.06 per cent.; during the third period the detention of cars on which the demurrage was $3 was 1.48 per cent., and during the second and third periods together the average detention amounted to 1.21 per cent. During the second period the detention of interstate cars subject to the $1 rate was 5.68 per cent., during the third period 5.32 per cent., and for the second and third periods together 5.56 per cent.

The net collections of demurrage during the first period throughout California amounted to $566,298, while during the second and third periods together the net collections amounted to $344,146, a decrease of $222,152 or over 39 per cent. During the first period the detention in excess of free time averaged 3.32 days per car, or 611,345 car days; during the second and third periods together the average detention of all classes of cars was 2.40 days or 170,164 car days, a decrease of .92 days per car and of 441,181 car days or 72.16 per cent.

These figures demonstrate beyond all question that the increased demurrage rate has been in no respect a burden upon the shipping and receiving public, but has been a very positive advantage to the railways and the shipping public as a whole. The Interstate Commerce Commission has said in the case of New York Hay Exchange Association vs. Pennsylvania Railroad Company, 14 I. C. C., 178: "The railway serves the entire public as a common carrier. In order to do this acceptably it must have the use of its equipment. The whole shipping public is interested in the prompt release of freight cars. It frequently happens that great inconvenience results from the insufficient supply of car equipment, so that it is for the interest of the entire public that cars should be promptly discharged." Cars are intended for moving freight, and the demurrage charge should, therefore, be high enough to force their release.

BLOCK SIGNALING FROM DIFFERENT POINTS OF VIEW.

THE signal engineer who wrote in our issue of December 13, page 1131, has aroused some pretty vigorous discussion. We cannot give space to all of the letters received, but the one printed last week and the others in this issue are fair samples. It seems desirable to summarize a few of the statements and arguments.

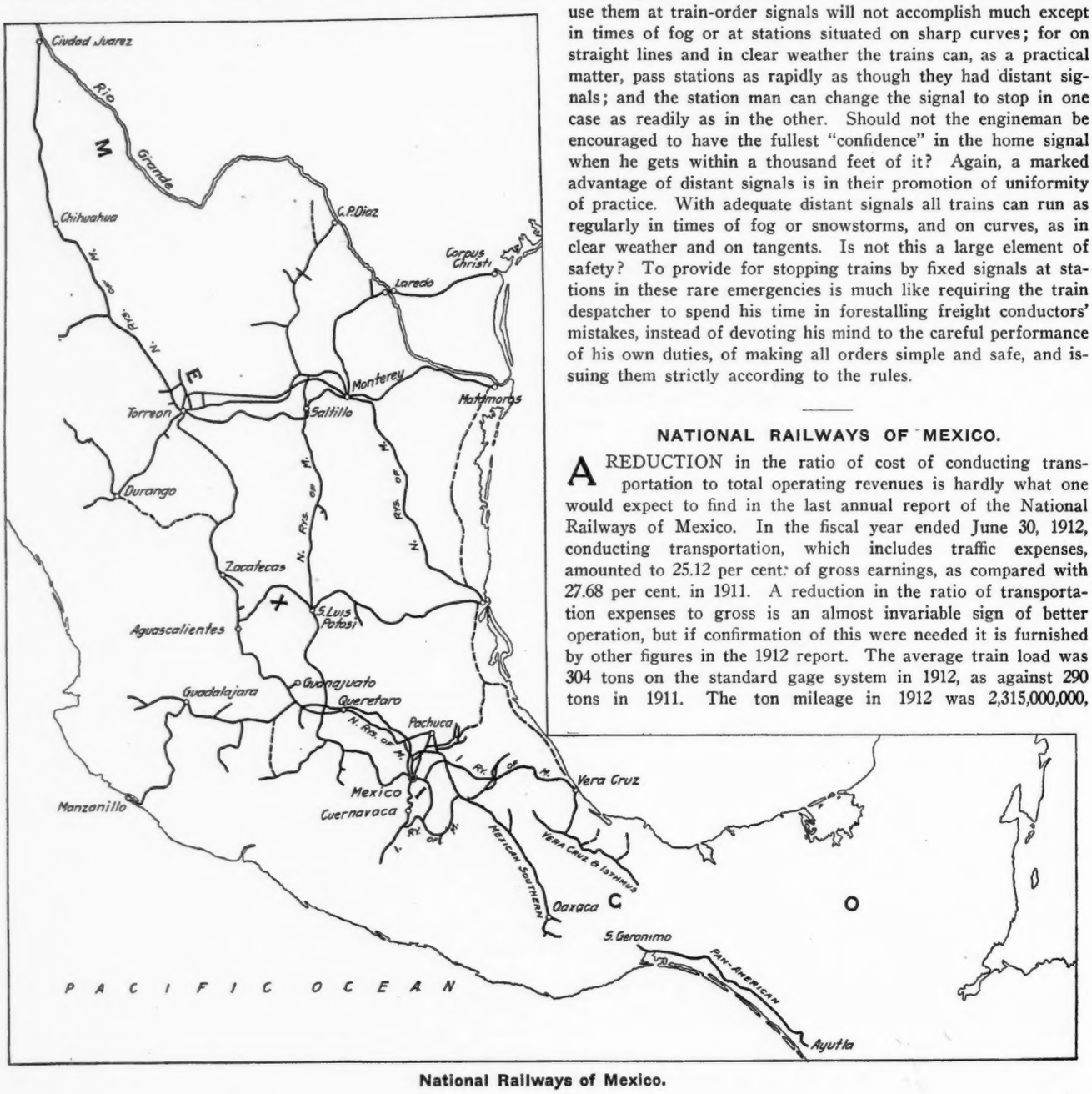
Taking matters chronologically, the first issue is, manual versus automatic signals. It is claimed, in substance, that the manual system is the safer. Can this be proved? With both systems there have been false clear signals, and a truly accurate, instructive and useful comparison is hard to make. But it is fair to assume that for the highest safety, either system needs something more than it now possesses. It is to be remembered that the public demands perfection, for a single bad collision in the United States, once in ten years, which would be such an infinitesimally small percentage of failures that the figures would be meaningless, would alarm the whole traveling community. And this demand of the public is not so unreasonable, after all; for the enterprising railroad president who is fully alive to this phase of his duty also aims at perfection; he calls on his subordinates to strive for perfection.

The problem, stripped of secondary matters is, simply, the prevention of collisions on the main line. Perfection of apparatus is an element of the question which we must not take up in this place for lack of time; and moreover, everybody aims to find a scheme of operation which will provide for safety in spite of failures of apparatus. The first point is obedience to signal indications. Our methods of discipline of enginemen, designed to enforce this obedience, are not perfect. Wise and competent managers will go on improving these methods. But the significant fact of the situation is that in England where, it is generally admitted, the percentage of obedience on the part of enginemen is very high, probably higher than in this country, the most advanced railway officers are looking to the automatic stop. They are not yet using it; we do not say that they will use it; but they recognize that moral or mental discipline alone is not sufficient. They recognize that the perfect engineman cannot be either discovered or trained. The small percentage of best enginemen now in the service became best by some process that the superintendent cannot copy. And signalman as well as the engineman is called on to be perfect; and the English roads, with the best signalmen in the world, nevertheless are making increased use of the "lock and block" or controlled manual system. While we cannot here go into the details of the subject we think it will be agreed that, with the manual system, the efficiency both of the signalman and the engineman must be improved by something more than mental and moral instruction or training. The human brain is the greatest machine known; but we recognize its limitations.

On the subject of automatic stops, we have nothing to say at this time, except to call attention to the statement of Mr. Winsor, of the Boston Elevated, who, speaking from an experience of ten years, says that the stops do enforce obedience to the visual signals. The last lines of his letter ought to have been printed in italics. Can anyone gainsay that testimony? It seems to us that this evidence—which is not the only evidence of the kind—

forever banishes from our discussions the old claim that a stopping apparatus is sure to weaken the engineman's sense of responsibility, and thus increase danger. The every-day function of a stop being that of disciplinarian, the apparatus would be very highly efficient even if it failed as often, say, as automatic signals fail—once in from one million to six million movements. We must honestly admit that, if a stopping apparatus weakens discipline the real trouble is in a grossly negligent method of managing the stops. It is true that stops located out in the wilds of the mountains are not so easily managed as on lines in New York, Boston or London, either as regards maintenance of apparatus or discipline of men; but if we use that as an argument we must then admit that we are going to put up with a lower degree of safety on the thin lines in the mountains. Safety costs money, wherever we go.

The third point that we wish to notice is our correspondent's argument against distant signals. His position seems to be that the utmost possible provision should at all times be made for giving stop signals in emergencies. If a station agent is ever likely to want to stop a train to prevent a collision, all trains should be required to slacken speed at the station so as to give the agent every possible chance. This road is a deceptive argument, resting on the assumption that emergencies should be dealt with after they arrive instead of being prevented. Ordinarily, we pursue that course only after every other resource has failed, or when there are other reasons to support our action. Steel passenger cars are in most cases probably better than wooden cars in a collision; but their use would hardly be justified on that ground alone; they are desirable for other reasons. They would be a detriment if they caused any relaxation of effort to prevent collisions. A railroad manager may be justified in getting along without distant signals if he is willing to slacken speeds, as is necessary to run at all times by the use of home signals alone; but if he does this, let the issue be plainly met. Distant signals are useful simply to facilitate fast running. A horse railroad, or one where trains run uniformly at six miles an hour, could get no profit out of them if they could be had for a cent apiece. Moreover, that committee which decided not to use them at train-order signals will not accomplish much except in times of fog or at stations situated on sharp curves; for on straight lines and in clear weather the trains can, as a practical matter, pass stations as rapidly as though they had distant signals; and the station man can change the signal to stop in one case as readily as in the other. Should not the engineman be encouraged to have the fullest "confidence" in the home signal when he gets within a thousand feet of it? Again, a marked advantage of distant signals is in their promotion of uniformity of practice. With adequate distant signals all trains can run as regularly in times of fog or snowstorms, and on curves, as in clear weather and on tangents. Is not this a large element of safety? To provide for stopping trains by fixed signals at stations in these rare emergencies is much like requiring the train despatcher to spend his time in forestalling freight conductors' mistakes, instead of devoting his mind to the careful performance of his own duties, of making all orders simple and safe, and issuing them strictly according to the rules.



National Railways of Mexico.

NATIONAL RAILWAYS OF MEXICO.

A REDUCTION in the ratio of cost of conducting transportation to total operating revenues is hardly what one would expect to find in the last annual report of the National Railways of Mexico. In the fiscal year ended June 30, 1912, conducting transportation, which includes traffic expenses, amounted to 25.12 per cent. of gross earnings, as compared with 27.68 per cent. in 1911. A reduction in the ratio of transportation expenses to gross is an almost invariable sign of better operation, but if confirmation of this were needed it is furnished by other figures in the 1912 report. The average train load was 304 tons on the standard gage system in 1912, as against 290 tons in 1911. The ton mileage in 1912 was 2,315,000,000,

as against 2,438,000,000 in 1911. The miles run by revenue trains amounted to 11,169,000 in 1912, a decrease from 1911 of 10.34 per cent. In this year a good part of Mexico was supposed to be, and was actually, in a partial state of revolution.

Not only is this showing of importance to security holders of the National Railways of Mexico, but it is of especial interest to railroad men in the United States because of certain labor problems which the National Railways has had to solve. In 1910 4.12 per cent. of the total number of employees were foreigners, while at the end of 1912 but 639 men, or 2.05 per cent., of the total number of employees were foreigners. The greater part of foreign (mostly American) trainmen, including enginemen and firemen, went on a strike during the past year, and, as President Brown puts it, "the diminution in the number of foreign employees is principally due to the voluntary separation from our service in April last of the major part of the foreign trainmen." That the company was able to make a saving in wages in the transportation department is not surprising, but that there should also be better train loading and other evidences of more efficient operation is an important factor in the consideration of the future of the company. The good showing in the operating department may be a result of the use of Mexican employees more extensively or it may be in spite of it, but it is worthy of note. Ever since the consolidation of the Mexican Central and the National Railroad, forming the National Railways, the policy of the management has been to utilize as far as possible and develop native industry, and it would seem that this policy is meeting with success.

The Ferrocarriles Nacionales de Mexico (National Railways of Mexico) operate 6,008 miles of road, of which about 383 miles is narrow gage. Of the total main line and branches, about 758 miles is laid with 85-lb. rail, 1,549 miles with 75-lb. rail, and 1,546 miles with 56-lb. rail, the remainder being laid with various weights. The operating ratio in 1912 was 62.55, as compared with 63.42 in 1911. Maintenance of way consumed 18.46 per cent. of gross in 1912 and 18.02 per cent. in 1911; maintenance of equipment, 15.76 per cent. in 1912 and 14.19 per cent. in 1911; conducting transportation (including traffic expenses) 25.12 per cent. in 1912 and 27.68 per cent. in 1911, and general expenses, 3.21 per cent. in 1912 and 3.53 per cent. in 1911. The freight traffic density is 339,452 ton miles per mile of road, and the passenger density 78,344 passenger miles per mile of road. The average train load has already been mentioned. On about half of the total mileage oil is used as fuel, and the cost of fuel for locomotives in 1912 amounted to $2,231,000,* as against $2,666,000 in 1911.

Of the total tonnage carried in 1912, 49.76 per cent. was furnished by mineral products, 23.48 per cent. by agricultural products, 11.56 per cent., by products of forests, 11.19 per cent. by general merchandise† and 4.01 per cent. by live stock and animal products. The average receipts per ton per mile are high, amounting to 1.502 cents in 1912. The average receipts per passenger per mile, on the other hand, are low, amounting to 1.439 cents in 1912.

During the last half of the fiscal year operation was interfered with to a considerable extent by the insurrection in the northern states of Mexico; but notwithstanding, total operating revenues in 1912 amounted to $30,724,000, as against $30,967,000 in 1911; and net revenue amounted to $11,507,000 in 1912, as against $11,328,000 in 1911. After the payment of interest and rentals there was a balance of $1,243,000 available for dividends in 1912 and $1,279,000 in 1911. The full 4 per cent. dividends were paid on the first preferred stock calling for $1,154,000. During the past four years interest charges have increased somewhat, amounting in 1912 to $8,702,000. The operating deficit of subsidiary lines has increased to a marked extent. In 1909 this totaled $11,427; in 1912, $417,167. The increase from $232,000 in 1911 to $417,000 in the deduction from income on account of the deficit of subsidiaries was in part offset in 1912 by a reduction in the amount appropriated from income pending charges on account of operating expenses. The amount so appropriated in 1911 was $1,074,000, and in 1912, $700,000.

During the year $1,386,000 was spent for additions and betterments, of which $453,000 was spent for increased weight of rail and $337,000 for additional ballast. The directors have approved the plans for a passenger station at Mexico City to cost in the neighborhood of $2,000,000. Plans for a freight station at Mexico City have not as yet been completed, but are under consideration.

At the time that the Mexican Central and the National Railroad of Mexico were consolidated the plans for making the operation of the combined properties more economical included the abandonment of certain parallel lines, and during the past year it was decided to abandon 289 miles and permission has been secured from the bondholders for this abandonment of property. Of course, the economies that may be expected to result can only be estimated, but should be considerable. In San Luis Potosi there are now two terminals, both of which are inadequate, and a new union terminal has been planned and work was begun during the past year.

Unlike the United States, Mexico had poor crops, so that there was no very heavy fall movement of crops to make demands on equipment. As a matter of fact, however, the equipment situation on the National Railways was worse at the end of the year than at the beginning. At the beginning of the year there were 652 standard gage locomotives in service, and at the end of the year 643; there were 441 standard gage passenger coaches, and at the end of the year 427; there were 18,471 freight cars, and at the end of the year 17,596. During the year orders were placed for 33 passenger train cars and 150 tank cars. When good crops, however, bring a return of prosperity, it is probable that the National Railways will find it necessary to make rather heavy orders for new equipment.

Like American railroads, the National Railways of Mexico have found considerable difficulty in doing new financing, and the £1,000,000 ($5,000,000) notes which fell due during the year were paid and to raise money it was found expedient to make another short term loan. A loan of $13,000,000 was raised in the United States at 5 per cent. for one year, the company depositing $12,500,000 prior lien bonds and $6,000,000 guaranteed general mortgage bonds. The cash position of the company was considerably better at the end of the year than at the end of the previous year. There was on hand $9,164,000, of which $3,660,000 was for payment of principal and interest on bonds, while at the end of 1911 there was $7,770,000 cash on hand, but of this amount $7,006,000 was for the payment of principal and interest on bonds. At the end of 1912 there was $24,423,000 notes payable, comparing with $16,405,000 notes payable at the end of 1911.

The following table shows the principal figures for operation in 1912, as compared with 1911:

	1912.	1911.
Average mileage operated	6,009	6,132
Freight revenue	$21,929,804	$22,598,874
Passenger revenue	6,774,194	6,328,555
Total operating revenues	30,723,896	30,967,211
Maint. of way and structures	5,670,017	5,580,965
Maint. of equipment	4,843,560	4,394,194
Conducting transportation (including traffic expenses)	7,717,811	8,570,708
General expenses	986,250	1,093,804
Total operating expenses	19,217,628	19,639,673
Taxes	239,304	206,773
Operating income	11,266,965	11,120,766
Gross corporate income	12,096,291	11,593,212
Net income	1,242,288	1,278,936
Dividends	1,153,316	1,153,316
Surplus	88,972	125,620

*All figures are in United States Currency.

†This apparently includes manufactures C. L. and merchandise L. C. L.

Letters to the Editor.

AUTOMATIC STOPS AS SURPRISE CHECKERS.

Boston, Mass., December 16, 1912.

To the Editor of the Railway Age Gazette:

The position taken by the Signal Engineer whose letter is printed in your issue of December 13, regarding automatic stops and distant signals, is readily understandable. His experience has shown him that automatic devices, such as block signals and automatic stops, are subject to failures, some of which are unexplainable and some of which are unquestionably due to the failure of the maintainer. His experience also, no doubt has impressed him with the fact that some enginemen will expect an automatic device, primarily installed to check their work, to do their work for them.

I believe that the automatic stop is a very valuable device for two reasons: (1) that it will, under proper conditions and when properly installed, prevent an engineman who is incapacitated from overrunning a signal; and (2) that it will, when properly designed and installed, give a continuous surprise check on all enginemen. An engineman who at any time fails to obey a signal equipped with an automatic stop will have his brakes automatically applied and, if the installation is properly designed, this fact will come to the attention of his superiors.

This last is, in my mind, the greatest advantage of automatic stops. The failure of an automatic stop will not, if it is properly designed, in any way interfere with the proper working of the signal. The only results that can happen in case an automatic stop fails to work properly are, (1) to stop the train when the signal is clear; and (2) to fail to stop the train if the signal is adverse, and the engineer does not himself stop the train. In the first case the result is a delay, and a report of the occurrence; and in the second case there is no failure to stop the train unless the engineman also fails to observe the signal. The engineman will not shift to the automatic stop his duty to stop the train, as the fact that he did so would in every case come to the attention of his superiors.

Automatic stops are subject to failures, and such failures may be extremely annoying, but they can do no harm. The Boston Elevated, on which automatic stops have been used more than ten years, has had no difficulty in having failures recorded, and finds no more disposition on the part of the men to hide such failures than to hide any other failures that should be reported. While there have been comparatively few cases where the automatic stops have unquestionably prevented an accident, they have resulted in an obedience of signals to such an extent that the overrunning of signals is practically unknown.

Paul Winsor,
Chief Engineer M. P. & R. S.

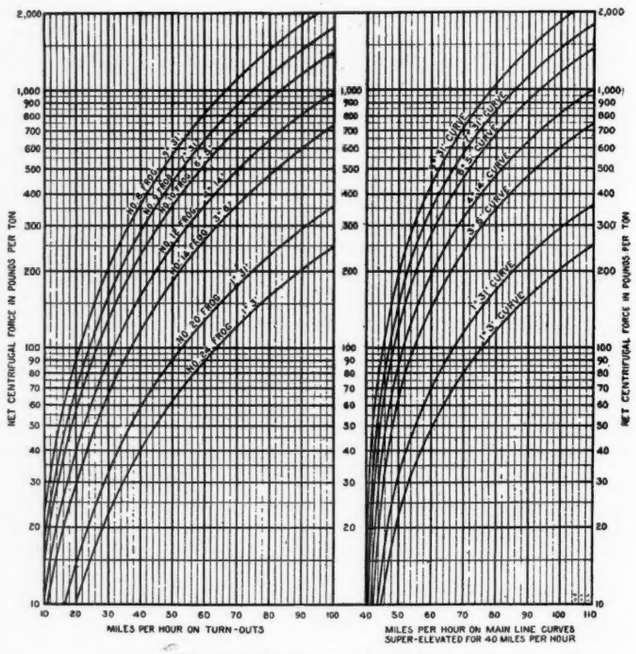
DISCIPLINE VERSUS AUTOMATIC TRAIN CONTROL.

New York, N. Y., December 6, 1912.

To the Editor of the Railway Age Gazette:

Owing to recent newspaper discussions regarding automatic train control or automatic stops as adjuncts to signal systems, and to the criticisms by more or less ill-informed people, of railroads for not immediately rushing into such schemes, it may be well to discuss first, speed on turnouts and second, the applicability of mechanical devices to control such speeds, and in general, to control the speeds of trains where there are already block signals in operation.

The following discussion of the physics of this problem is so elementary that it would seem unnecessary, except for the fact that some of the critics—and so-called scientific papers—who are loudest in their condemnation of railroad engineers for knowing nothing about centrifugal forces seem themselves to have no correct apprehension of the forces involved. The fundamental principle involved is Newton's first law: "Every body continues in its state of rest or of uniform motion in a straight line unless it is compelled by forces to change that state." Therefore, a moving mass, such as a railroad train, if uninfluenced by external forces would continue indefinitely at a uniform speed in a straight line. To deflect it from a straight line or tangent some force must be brought to bear. There is no mysterious force in a moving body which suddenly appears when it is taking a curvilinear motion and disappears when on a tangent or which acts upon a turnout and not upon the main line. It is the confusion of thought brought about by this misconception which obscures the problem. When it is desired to deflect a train which is moving on a tangent the curved outer rail furnishes the radially directed pressure which achieves the result. The more rapid the motion of the train and the greater the deflection in a given distance, the greater is the pressure which the rail must exert to attain the desired result. Furthermore, the diverting force of the rail is not on the same plane with, nor at the same height as the center of gravity of the mass deflected. The consequence of this is, that in endeavoring to resume its rectilinear motion, the mass is subject to a radial overturning moment. All this is very elementary, but its clear conception is necessary to the following statement, that so far as the so-called centrifugal force is concerned, there is no difference in the effect upon a moving train between a main line curve and a turnout or other curve under the same conditions of curvature. Therefore, theoretically, there is no reason why a train should not take a turnout curve at the same speed at which it takes a main line curve of the same curvature, so far as centrifugal forces alone are concerned.


NET CENTRIFUGAL FORCE IN POUNDS PER TON
MILES PER HOUR ON TURN-OUTS
MILES PER HOUR ON MAIN LINE CURVES SUPER-ELEVATED FOR 40 MILES PER HOUR

Turnout Curves are Theoretical.

Force Which Must Be Exerted on Outer Rail to Deflect a Moving Train.

But the requirements of the case necessitate a difference of construction of a turnout from a main line curve, as it is always possible to super-elevate the outer rail of a curve on a main line, a thing which cannot usually be done on a turnout. This super-elevation must be fixed for some average speed so that for a fast moving train the resultant of all the forces shall remain well within the base furnished by the rails, and for slow moving trains no undue portion of the load shall come upon the inner rail. The common practice on single track western roads is to

super-elevate for a speed of 40 miles an hour, at which speed the resultant of the weights and forces is normal to the plane of the track near its center, and the curve can be taken at any speed in excess of this which does not throw this resultant beyond the outer rail. The turnout, however, cannot usually have super-elevation and must, therefore, be taken at a speed somewhat slower than a main line curve of the same curvature. For example, a train traveling at 50 miles an hour can take the lead to a turnout having a No. 14 frog with the same safety with which it could take a 9 deg. 31 min. main line curve, although this might be excessive in either case; and a train could take a turnout having a No. 20 frog at 50 miles an hour as safely as it could take a 4 deg. 14 min. curve at the same speed (see diagram). Owing, however, to the want of continuity of the rails, brought about by the introduction of the frog, and to reversal of curvature, the speed on a turnout is usually reduced to about one-third the speed on a curve of corresponding degree on main line. In point of fact the turnouts are really safe for a higher speed than this, as the overturning moment diminishes as the square of the velocity, and a restriction of one-third speed or one-ninth the moment should be well within the safe limit, with proper maintenance. If, however, the question should be asked as to what is the safe frog and turnout curve, the answer must be, that on any curve there is a limiting speed beyond which it is unsafe to run and the use of a long turnout is no more protection against reckless running than is low curvature on the main line.

This suggests the thought of mechanical adjuncts, such as automatic controls, to prevent reckless running. So far as developed none of these have yet proven successful in service tests under the operating conditions of a steam railroad, and if they should be required, they should be applied not only at turnouts, but at all curves, at the beginning of each down grade and at any other places where reckless running is possible. The function of the engineer then becomes merely opening the throttle. The machine does the rest—maybe—and the responsibility of running past signals or diminishing the speed to a safe one, on a curve or turnout, is shifted from the engineer, who has a personal interest in the safety of his train, to the track maintainers, and to the equipment maintainers, with the consequent impossibility of fixing the responsibility for a resulting accident on any particular person. The assertion is frequently made and is doubtless true, that it is after all a question of cost, but such cost does not appear to be justified by the present development of automatic control. If developed in the near future, it is a question whether the expenditure should be undertaken by any road when so much money is required for the extension and perfection of block signals, the elimination of grade crossings, increase of number of tracks, more extensive terminal facilities, etc.; all of which are urgently needed and are taxing the resources of all of the railroads in the United States. Many things may be desirable which are impracticable. For instance, to avoid accidents due to broken rails, policing of the track might be extended to having a watchman stationed at each rail; but it is to be hoped that the state and national commissions will not require this at present. Through the use of carefully designed, properly located and maintained automatic signals, surprise tests and efficient track maintenance, some of the principal trunk lines have now reduced their fatal accidents to an extremely small number per annum. To require such roads to impress on the already efficient engineers of their fast and heavy trains the idea that observation, care, knowledge of their runs, and obedience to rules, may all be abandoned and an automatic machine substituted for their intelligence—their functions being restricted to merely starting a train after it is once stopped—would be to undo the successful work of recent years of the best operating men in this country and to introduce new dangers in operating. Under such conditions the railroads would very properly employ a cheaper grade of men to run their engines and would have good grounds for doing so, just as in the case of the electrically controlled roads in certain subways and tubes, "a motorman can be made in two hours." A possible future development of a successful automatic train apparatus, applicable to the severe conditions of the steam roads, will inevitably lead to the abolition of expensive men on the railroads, and the substitution therefor of machines plus laborers.

It appears that our real trouble is our lack of help from the public in such matters. When it comes to navigating a ship, in case of disobedience of rules, neglect of duty or inefficiency, the government takes in hand the delinquent officer and suspends him, or deprives him of his license and prevents him from making a living at his profession. The engine runner holds the same relations to the public, as does the officer of a ship, and should be controlled in the same way. If the government, through its lawmakers would inflict a similar penalty on a reckless locomotive engineer, who disobeys the rules for the safety of the public, established by all of the leading roads in the United States, revoke his license and otherwise hold him responsible to his fellow citizens for want of care in most responsible duties, this would furnish a powerful incentive to vigilance. Instead of this the public says, in effect, to the railroad corporation: "If your men do not obey rules and an accident results it is your fault for not supplying some mechanical apparatus to take their places. We do not know what such an apparatus is, or whether such an apparatus can be made, but it is your duty to find one and apply it."

JOHN D. ISAACS,
Consulting Engineer, Harriman Lines.

WHY NOT EXPERIMENT ON THE PANAMA RAILROAD?

CHICAGO, Ill., December 14, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In reading your editorial on the Interstate Commerce Commission's report on the Westport derailment, it has occurred to me that the government has an exceptional opportunity to put the recommendations of the commission to practical test for the benefit of the railroads of the country. To the best of my knowledge there are no automatic stops on the Panama Railroad. There is a fine chance to "try it on the dog" going to waste. There has been some expression of a desire on the part of the railway officers of the country for a railway laboratory. The Panama Railroad could be used for this purpose to great advantage, and also to the great benefit of inventors who are now trying to get Congress to pass bills which will compel the roads to use their devices. Friendly congressmen should find no difficulty in loading the government road to its capacity with these devices, thereby making both votes and valuable contributions to knowledge.

BYSTANDER.

AUTOMATIC STOP DIFFICULTIES.

PITTSBURGH, Pa., December 25, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

That ten thousand dollar offer for an automatic stop, noted in your issue of December 20, page 1169, was, indeed, an "easy one." You might well have used even stronger language in showing how far behind the times that fifteen-word specification is. Signal engineers are acquainted with at least a dozen devices that would answer that requirement. You might also have used more emphatic language in your statement of the elements of the real automatic stop problem. Unfortunately, the devices which meet the requirement in that advertisement, when we take the specification literally, cannot be depended upon to work with that certainty and reliability which is required in a device which, to serve the purpose, must operate invariably.

But lack of mechanical certainty is only one of the reasons why, up to the present time, a stop that will satisfy the requirements has not been produced. Several of these stopping devices may work with a fair degree of regularity, but experience has shown that devices of the kind are apt to fail when they are most needed

to check the action of the engineman. The road using such devices would, in the event of a failure of the device to work, be in the position of having provided at great expense a reputed "safety device" without really increasing in any reasonable degree the safe movement of its trains.

Under the varying conditions of service and the peculiar construction required by this class of apparatus, several of the train control devices have to be provided with a hand release, placed in the cab of the engine, convenient to the hand of the engineman, to permit him, when necessary to do so, to cut out the stopping device and release the brakes, allowing the train to proceed. Then the assumption is that the engineman may safely be depended upon not to "press the button" and release the brake when there is danger ahead; but experience has shown that the engineman cannot be relied upon to operate the release only when there is no chance of an accident resulting.

Under this general condition accidents are to be expected, notwithstanding an expensive device may have been installed. "Familiarity breeds contempt" is an old saying; and when, in addition, an engineman "gets the habit" of working the release, dependence for safe working cannot be placed on a train control or automatic stopping apparatus using a device of the kind as a necessary or permissible part of its equipment.

Then, again, the stopping devices that have been developed to the highest degree of efficiency require the use of the overlap, with its restriction of the capacity of a track measured by the number of trains that may be run in a given time; with the consequent complications of the signal apparatus and controlling circuits, and with the objectionable operating methods or practices which must be followed at interlockings. To be successful, from an operating standpoint, the train control device should work with safety and reliability without requiring the use of the overlap.

It is the opinion of many experienced signal engineers that the conditions which will be found necessary in the operation of trains when an automatic stop is in use will prove to be so difficult that but slight, if any, additional protection may be expected or will be secured by the use of the stopping device. Great difficulty will be experienced in maintaining the train control apparatus in perfect working order; and with the difficulty, if not impossibility, of securing reliable working with a device requiring a hand release in the cab, to be operated at will by the engineman, the advantages of being able to stop a train in a few (rare) instances will be more than offset by the increased hazard in every-day operation. It is hoped the New Haven will revise its specifications, stating more clearly and exactly the conditions as to permissible restrictions of traffic and the requirements essential to reasonably complete protection to be met. This side of the question must be fully dealt with before a train control device can be agreed on which can be considered as working with that degree of safety and reliability which will warrant its installation on the tracks of a trunk line railroad. C. S. N.

THE MASSACHUSETTS COMMISSION.

Boston, Mass., December 26, 1912.

To the Editor of the Railway Age Gazette:

I have read with much interest and entire approval of your piece "The New Haven Monopoly," as re-printed in the Springfield *Republican* of the 24th inst., but you say—"in the West where the movement for regulation of railways was born." Will you not give me the date of this birth? We have had a Railroad Commission in Massachusetts since 1869, and it was given the initiative and made its duty to regulate railroads in every particular; and it seems to me it should be called to account, first as our laws are ample and mandatory, although you would not even suspect it from the campaign that has been carried on here. I have followed public service corporation questions for twenty years and no state in the Union has so little excuse for bad conditions as ours and the whole trouble has been the excellent laws have not been enforced. Mr. Mellen could not be more truly sized up than you have done. Now why not do the same with our Railroad Commission? Is ours a government of laws or not? If public officials do not obey the laws how can you expect the people to? These laws affect life and limb, to say nothing of convenience and comfort, and they have been our laws for forty years. They were built on publicity and that has been ignored grossly, so that even legal lights like Mr. Brandeis seem to have completely lost sight of them. I have finally got Governor Foss to call upon the Commission for a full explanation and it ought to be interesting and bring the matter to a head. John H. Carter.

HEAVIER LOCOMOTIVES VERSUS GRADE REDUCTION.

Baltimore, Md., December 23, 1912.

To the Editor of the Railway Age Gazette:

I noticed an editorial reference in the issue of the *Railway Age Gazette* for November 1, page 821, calling attention to the proper design and selection of locomotives to suit particular operating and physical conditions, referring particularly to the Mallet locomotive and its limitations. While it must be admitted that a careful investigation and an analysis of conditions are necessary, and will oftentimes be a check on the promiscuous purchase of a type of motive power which, because of good results in certain work, is high in favor, I cannot admit that such an analysis will result in obviating the necessity for heavy expenditures to reduce grades, etc., as suggested by Mr. Beyer in his paper before the American Society of Mechanical Engineers, abstracted in your issue of December 13, page 1145.

As a general rule, capital expenditures for reducing grades, eliminating curves, etc., are confined to certain critical points of an operating division. As a chain is limited by its weakest link, so is the train load limited by the maximum grade on a division. This may be very short, but reducible at considerable expense, or there may be several maxima, similarly reducible. To attempt to largely save this expense by putting locomotives of greater tractive effort into service would probably not be seriously considered, as a short analysis will indicate.

It is not denied that increased capacity of motive power will result in increased train load. Economy in that direction has been improving steadily for years, and there now seems to be a feeling that the limit is not far off. Such increase cannot, however, prevent the rating of a train from being controlled by certain critical points above referred to. If the train is fully rated for the low grade portion of a division, it cannot be operated over the critical grades, and, conversely, if rated for the maximum grades, it is operated far below its capacity over the remaining territory. Such operation is far from efficient, and there seems to be no possible way to radically improve the situation except by reducing grades. Of course, results are being obtained without this, where the cost would be prohibitive, by operating certain districts as helper grades. This, however, saddles operation with the cost of helper service, and on a busy line would capitalize at an enormous figure. No type of road engine could save this expense. In short, the object of reducing a critical grade is not to enable a given standard engine to haul more cars, but to make possible an increased haul for *every* engine, without breaking load at the foot of the grade, or being operated below capacity before reaching it. Theo. Bloecher, Jr.

Belgian International Exhibition.—At the International Exhibition at Ghent next summer, all the leading Belgian industries will be represented. The field to be covered is a very wide one, including as it does railway and colonial enterprises, coal mines, iron works, copper mines, stone quarrying, blast furnaces, steel works, glass blowing, zinc works, plate glass manufactures, sugar refineries, rails and rolling stock. Besides all these, Ghent will show a marvelous field of activity in textile trades, while the horticultural and agricultural side of the exhibition will also be well worth seeing.

THE HOPATCONG-SLATEFORD CUT-OFF.

Second Article, Describing Very Heavy Bridge Work, Including Largest Concrete Railway Bridges Ever Built in this Country.

By C. W. Simpson,
Resident Engineer, Delaware, Lackawanna & Western.

One of the distinctive features of the Hopatcong-Slateford cut-off of the Lackawanna, the general description of which was published in the *Railway Age Gazette* of December 6, is the almost exclusive use of concrete for structures. Out of a total of 67 structures at stream, highway and railway crossings only one is of steel. With a few exceptions these structures are of the arch type, with spans varying from three to 150 ft.

Fig. 1—Slab Type Highway Bridge Over Tracks

In some instances where there was not sufficient clearance to permit the use of the arch type, a reinforced flat slab type was used.

The structures may be classified roughly under four heads: reinforced slab or beam type, semi-circular arches carrying the railroad embankment and tracks, elliptical spans carrying the highways over the railroad, and long concrete bridges composed of several arch spans.

SLAB TYPE STRUCTURE.

The slab type is very well illustrated by two structures at Slateford, Pa., one designed to carry a highway over six tracks,

Fig. 2—Typical Slab Type Culvert for Waterway.

four of which have been laid, and one carrying four tracks across Slateford Creek. The highway structure is composed of three 37 ft. spans; the center line of the roadway being at an angle of 55 deg. 8 min. with the tracks. Each span consists of a 12 in. slab resting on eight longitudinal beams 20 in. deep, 10 in. wide at the bottom and 14 in. wide at the top, spaced 5 ft. center to center. The slab and beam concrete was placed at the same time so that they form "T" beams. Each beam is reinforced with six 1 in. square bars and the floor slab with ½ in. square bars spaced 4 in. center to center. The bottom of the face beams was curved to give the appearance of a very flat elliptical arch. The connection between the floor system and the piers and abutments is stiffened by 22 in., 45 deg. corbels. The piers are 2 ft. 1½ in. thick at bottom, 1 ft. 10 in. thick under the corbel, and 25 ft. high above the footings.

As the narrowness of the piers made it inadvisable to have a transverse construction joint in the floor system, the concrete was placed continuously from end to end, and two longitudinal construction joints, midway between beams, divided the floor into three construction sections. A railing composed of concrete posts and two lines of 2 in. pipe protect the roadway, which was paved with a 3 in. coating of Amiesite placed directly on the floor slab.

The structure over Slateford Creek is composed of two 14 ft. slab spans carried on two plain abutments and one plain pier, on gravel foundation. The pier is 2 ft. 6 in. thick above the ground surface and 4 ft. 6 in. thick at the bottom of foundation. The slab is 2 ft. thick and is stiffened at the pier and abutments by 24 in., 45 deg. corbels. The slab reinforcement consists of 1 in. square bars spaced 4 in. center to center,

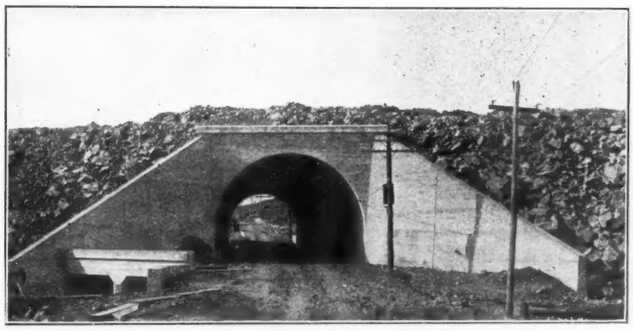


Fig. 3—Typical Arch Culvert for a Highway.

with every third bar bent up at the quarter point. The top of coping is level with the top of the rail.

THE SEMI-CIRCULAR ARCH.

The semi-circular arch type is best illustrated by the arch over the Morris and Sussex turnpike near Andover, N. J. This is a combined highway arch and culvert, under an embankment 90 ft. high. Originally the stream and highway were 300 ft. apart, but the stream channel was changed so that both could pass through the same structure. The arch barrel is 221 ft. long, has an inside diameter of 33 ft. and varies in thickness according to the depth of the embankment over it. Thus the crown thickness at the center is 2 ft. 9 in., while at the ends it is 2 ft. 6 in., and the abutments are 22 ft. 2 in. broad at the center and 17 ft. 10 in. at the ends. The arch ring is reinforced longitudinally with ¾ in. square bars spaced 2 ft. center to center near both the inside and outside surfaces. The culvert occupies the entire width between abutments, the roadway being carried on a 1 ft. 4 in. slab, reinforced transversely with ¾ in. square bars spaced 6 in. center to center and longitudinally with ½ in. bars spaced 2 ft. center to center. The slab was built as an integral part of the abutment and is

divided into two spans by a center pier 2 ft. wide, making the culvert a double box with 15 ft. 6 in. span. Beyond the arch barrel the culvert is carried along the wing walls until it clears the roadway.

ELLIPTICAL ARCHES.

A good example of the overhead highway arches is shown in one of the accompanying photographs. All arches of this type provide clearance for four tracks, requiring a minimum span of 56 ft. The highway at this point makes an angle of 74 deg. 15 min., with the tracks, requiring a span of 58 ft. 2 in. The intrados is a semi-ellipse having a rise of 9 ft. 6 in. The barrel is 18 in. thick at the crown and is reinforced longitudinally by 1 in. square bars spaced 12 in. center to center, near the upper and lower faces, and transversely by 1-in. square bars spaced 24 in. center to center. Spandrel walls, with a 2 ft. 6 in. coping, retain the spandrel filling and the roadway is protected by a concrete railing surmounting the coping. The concrete for the arch ring was placed continuously from springing line to springing line, and the spandrel walls, up to the bottom of coping, were placed at the same time.

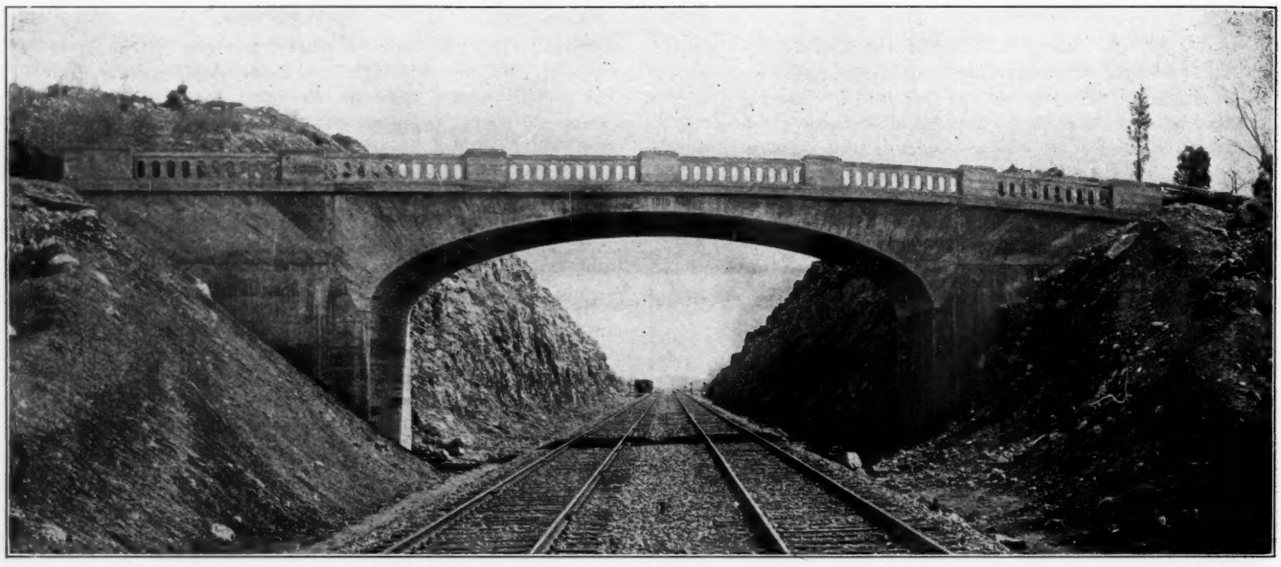


Fig. 4—Elliptical Arch Carrying Highway Over Tracks.

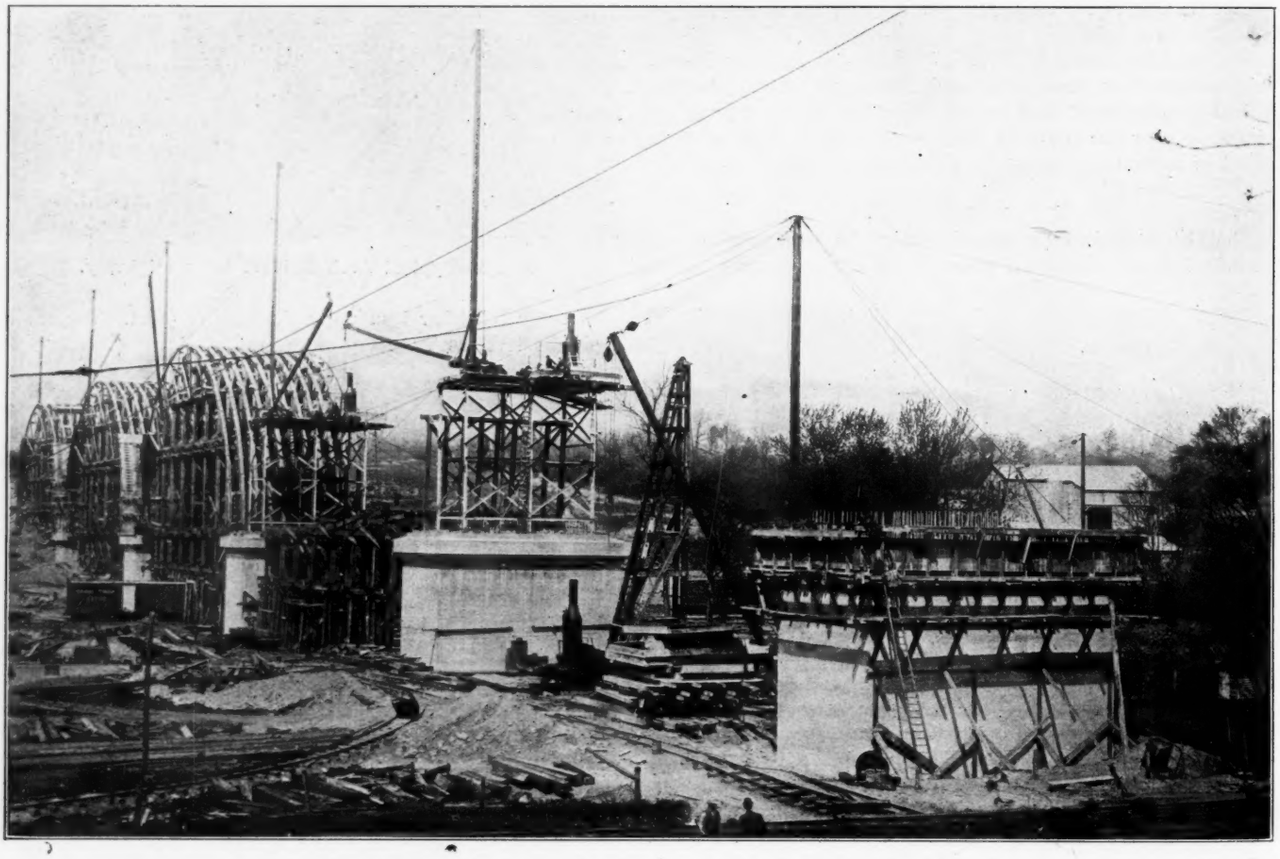


Fig. 5—Early Stages in Construction of Paulins Kill Viaduct.

THE PAULINS KILL VIADUCT.

There are two structures of the fourth type; one at the crossing of the Paulins Kill river, the New York, Susquehanna & Western, and a highway at Hainesburg, N. J.; and one across the Delaware river, the old line of the Delaware, Lackawanna & Western, and two highways near Slateford, Pa. These bridges have been said to be the largest concrete structures yet erected for railroad purposes in America.

The Paulins Kill bridge is composed of five 120 ft. and two 100 ft. semi-circular arch spans, carrying a floor system composed of 13 ft. semi-circular spandrel arches. The abutments are a modification of the "U" type, being composed of three longitudinal walls carrying a reinforced floor slab. The embankment is allowed to take its natural slope between these

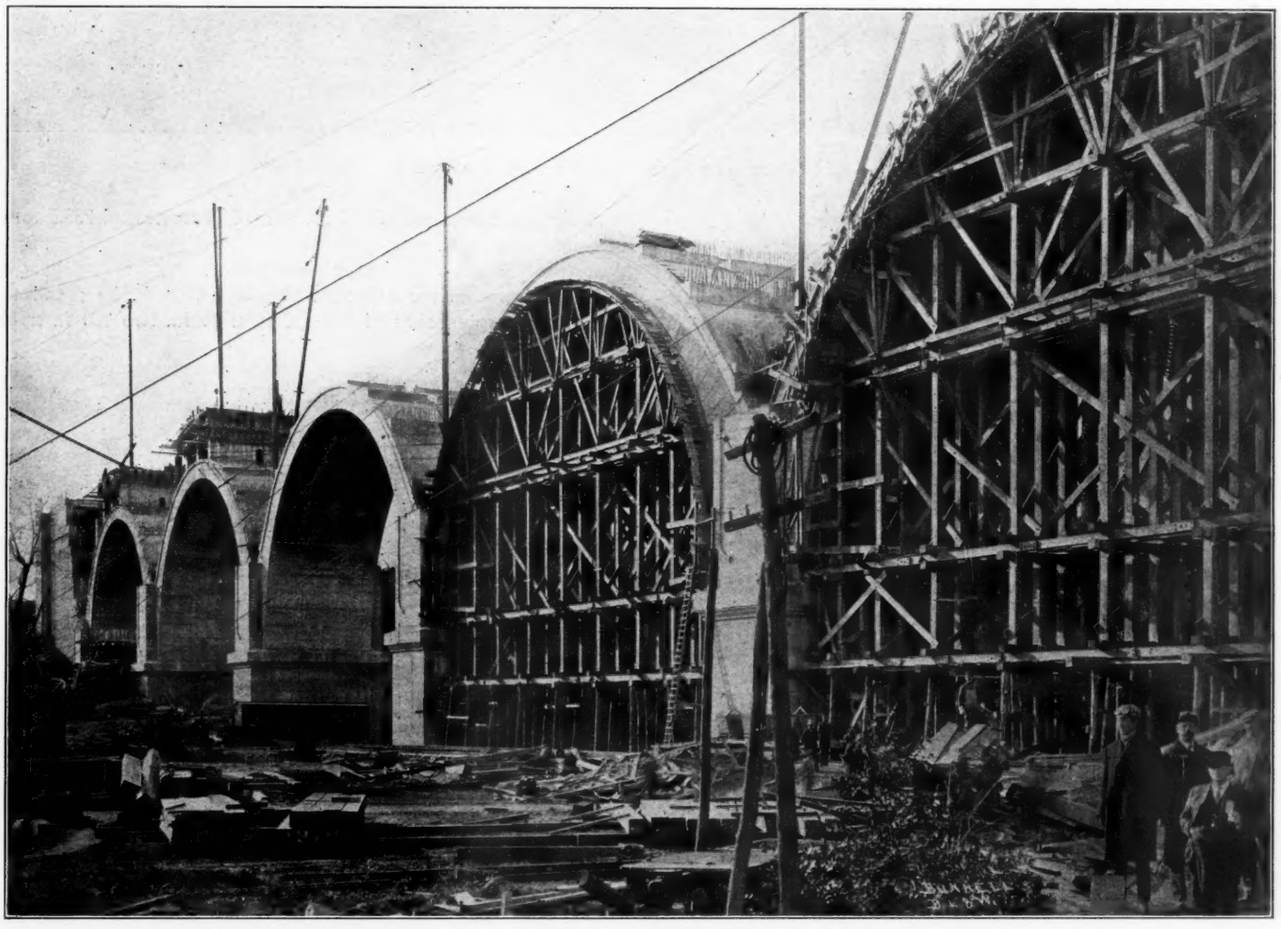


Fig. 6—Completing Arch Rings and Starting Spandrel Walls on Paulins Kill Viaduct.

walls so that they do not act as retaining walls and carry only the load transferred to them by the floor slab. The walls are stiffened by reinforced struts, extending from wall to wall. The viaduct is 1,100 ft. long end to end of masonry, and is 34 ft. wide face to face of arches, with the pier pilasters projecting 4 ft. The top of the coping, which is level with the top of rail is 120 ft. above the stream bed.

The floor is waterproofed with five layers of Neponset Water Dike felt and one layer of burlap, protected from injury by the stone filling with one course of brick. The joints in the brick protection coat were filled with a waterproofing compound. The foundations were carried to bed rock, which is near the ground surface except at the two piers near the stream, where the excavation was 35 ft. deep. These excavations were sheeted with 3 in. x 12 in. yellow pine driven the entire depth by a Vulcan steam hammer. The water was kept out of one excavation by two 6 in. centrifugal pumps, but the other excavation was so wet that the concrete was deposited by means of a tremie.

The construction work was carried on by a system of derricks, having 75 ft. masts and 65 to 80 ft. booms, operated by Mundy double drum hoisting engines. The derricks were first erected on the ground surface at each pier and from this position constructed the piers to a point about 10 ft. above the springing line. A steel tower 30 ft. high, composed of six 9 in. I beams braced with 5 in. channels was then erected on the pier and the derricks transferred to a platform at the top of the tower. From this position the derricks completed the main arches and two spandrel arches over the crown of each main arch. They were then moved to the top of these spandrel arches and from this location completed the remainder of the work.

For constructing the main arches the contractor used one set of 100 ft. and three sets of 120 ft. timber centers. These centers were framed and assembled into units that could be handled by the derricks and narrow gage rolling stock, in a timber yard equipped with circular and band saws, a planer, and other wood working machinery. A large part of the forms were built in sections at the timber yard and were erected, taken down and re-erected by the derricks.

The concrete mixing plant was located about 300 ft. north of the bridge on the west side of the stream. Stone was quarried from a hill just back of the mixing plant and conveyed in dump cars to two Farrel jaw crushers from which it was taken by bucket conveyors to two 200 cu. yd. stone bins located over the mixers. Sand was dug from a pit about one-half mile from the mixing plant by a clam shell bucket and was conveyed to the sand bins, located alongside the stone bins, in 4 yd. 3 ft. gage side

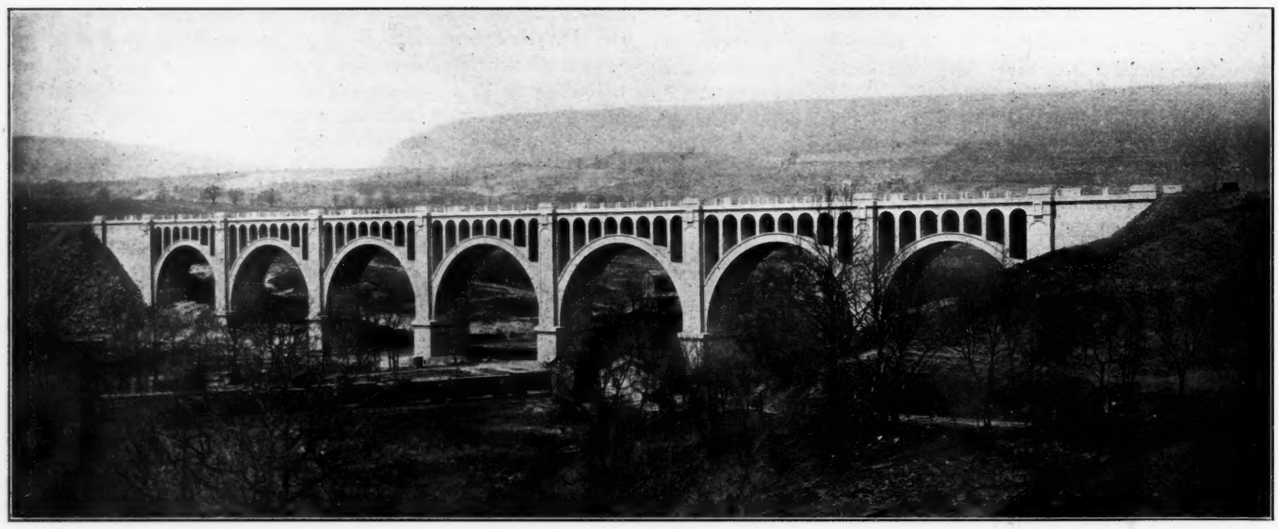


Fig. 7—The Completed Paulins Kill Viaduct.

dump cars. Measuring hoppers located below the storage bins discharged into two 1 yd. McKelvey mixers. Each mixer discharged into a hopper from which the concrete passed into 1½ yd. bottom dump buckets on 3 ft. gage flat cars. Twelve ton Baldwin locomotives hauled the cars to all parts of the work, crossing the stream on a temporary wooden bridge. A standard gage track connected the mixing plant with the N. Y. S. & W., and cement was unloaded from the original cars and placed in a cement house, on a level with the storage bins, by a derrick. This standard gage track extended under the storage bins and crushed stone for several smaller structures was shipped from this plant. This structure required 43,212 cu. yds. of concrete and 735.5 tons of reinforcing steel.

DELAWARE RIVER BRIDGE.

The Delaware river bridge, which is 1,476.8 ft. long end to end of masonry consists of five 150 ft. x 40 ft., two 120 ft. x 40 ft., and two 54 ft. x 16½ ft. elliptical arches, and is 34 ft. wide face to face of arches. The 150 ft. and the 120 ft. arches support a floor system composed of 13 ft. spandrel arches and the two smaller arches carry longitudinal spandrel walls, which retain the stone filling placed directly on the backs of the arches. The west abutment is of the ordinary "U" type, but the east

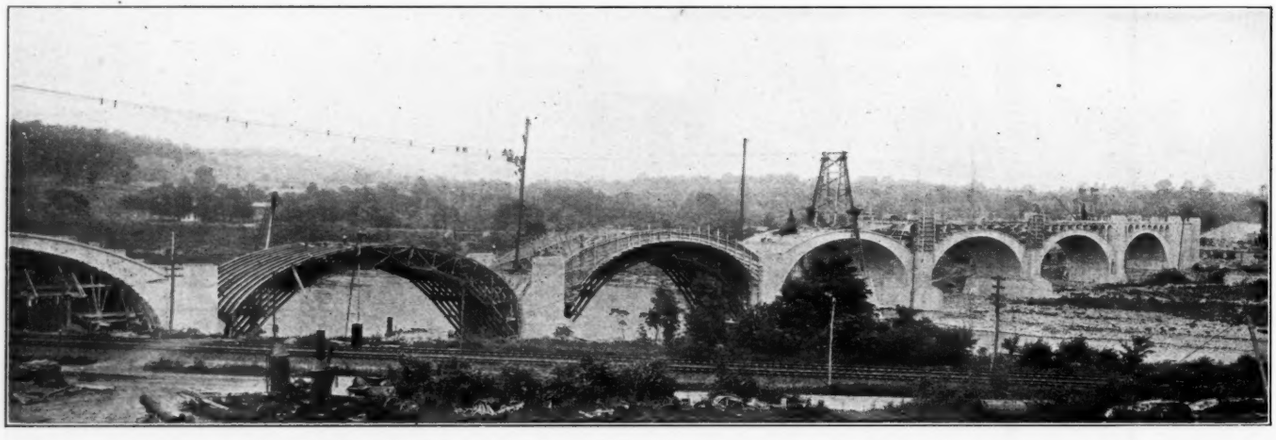


Fig. 8—The Delaware River Bridge in all Stages of Construction.

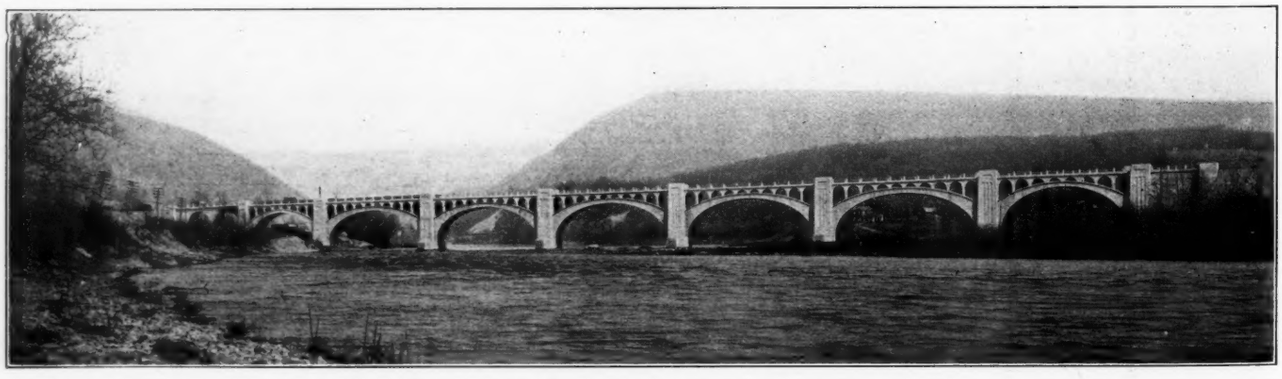


Fig. 9—The Completed Structure Across the Delaware River.

abutment is modified in that the walls are not a gravity section, but are tied together at about one-third their height by reinforced transverse ties, and are heavily reinforced to act as cantilever beams above these ties.

The east two-thirds of the bridge is straight and the longitudinal axis of this portion makes an angle of 65 deg. with the centerline of the piers and with the elements of the main and spandrel arches. The west one-third is partly on a 3 deg. 36 min. curve and partly on a spiral connecting the curve with the straight portion.

The west abutment and the pier between the two smaller arches rest on a gravel foundation, but all other foundations are carried to bed rock. The depth of the rock varied from 25 ft. in the center of the river to 60 ft. at the banks and no particular difficulty was encountered in making the excavations. The piers are of solid concrete up to the extrados of the main arches, above which the pilasters and adjoining spandrel walls form a hollow pier. In constructing the main arches the work proceeded from the east end and five arches were turned during one season. As the piers were not entirely stable under the unbalanced thrust of one arch, and as it was unsafe to leave any centers in the river during the winter, on account of large amount of ice carried during that season, the last pier was considerably enlarged below the ground line and acted as an abutment pier.

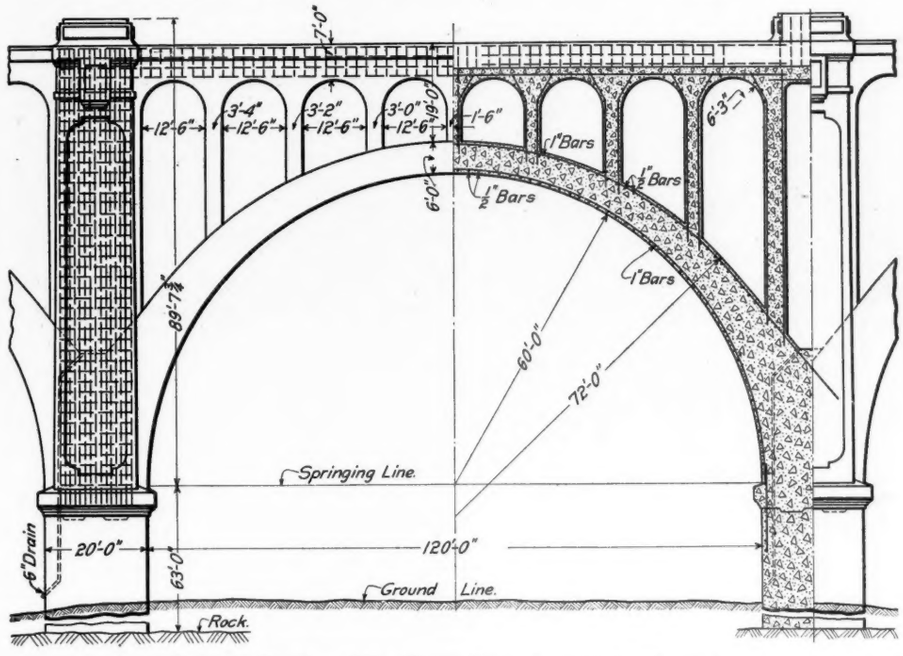
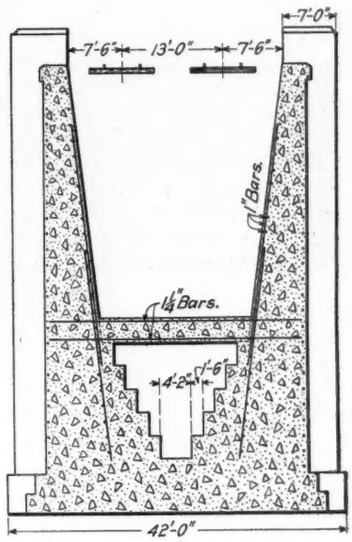


Fig. 10—Paulins Kill River Viaduct at Hainesburg, N. J.



Cross Section of Abutment of Delaware River Viaduct.

The floor system above the springing line of the spandrel arches was constructed in sections about 90 ft. long, but the reinforcing bars were continuous past the construction joints, so that there are no expansion joints of any nature from end to end of the structure. The floor was waterproofed with a ⅛ in. layer of a patented compound prepared and applied by the Masonry

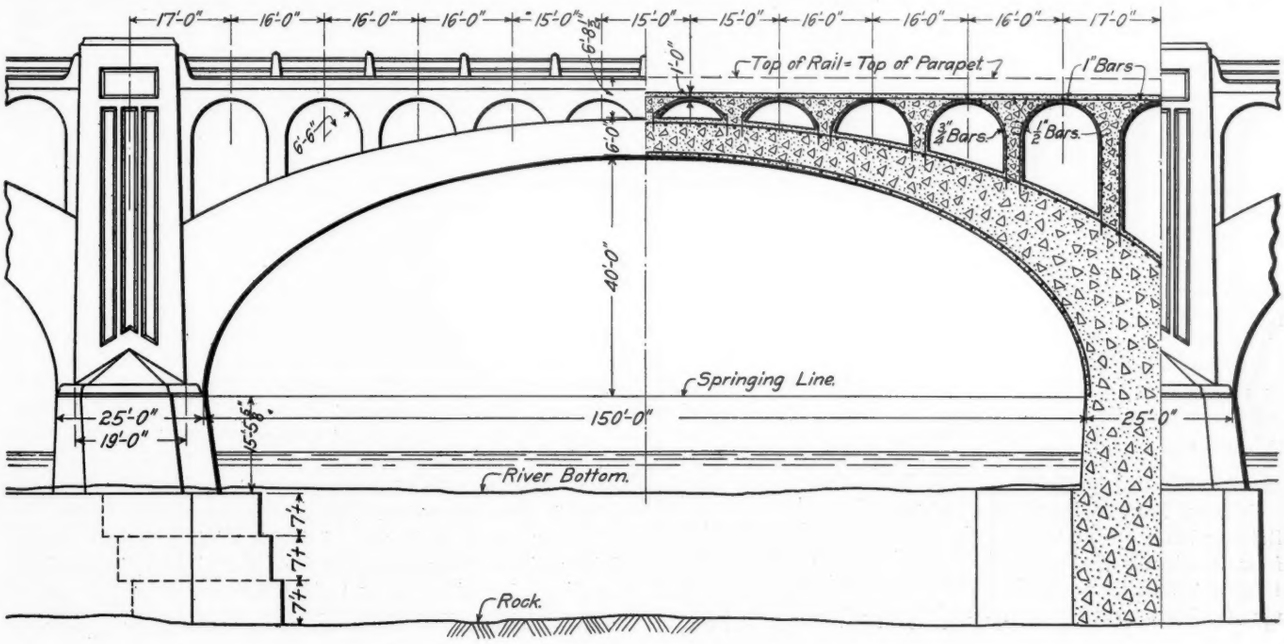


Fig. 11—Delaware River Viaduct at Slateford, Pa.

Waterproofing Company, and protected against injury from the stone filling by a 3 in. layer of concrete.

The contractors used timber centering for the 54 ft. and 120 ft. spans and two sets of steel centering for the 150 ft. spans. The steel centers for one arch consisted of ten three-hinged arch ribs, supported at the piers by short steel columns resting on I-beam grillages which were supported on the footings of the adjacent piers. These ribs were joined together into a rigid structure by lateral and cross-frame bracing. The interesting feature of these centers was the device for lowering them. This consisted of an extension member and toggle on each side of the crown pin. The extension member is built up of two channels battened and latticed together and divided at the center to allow the insertion of an iron block pierced by a threaded hole in the end of each half. A heavy screw is worked in these blocks by means of a ratchet and lever, so as to lengthen or shorten the member. By lengthening this member the horizontal axis of the toggle is shortened and the centers are lowered. The centers were designed, built and erected by the McClintic Marshall Construction Company.

The construction work was handled by a combination of derricks and cableways. The cableway was composed of two 2¼ in. cables spaced 17 ft. center to center, supported at each end by a timber tower 125 ft. high and near the center by a timber "A" frame with the legs resting on two concrete piers 30 ft. high. The "A" frame legs were spread so as to clear the bridge structure, and the concrete piers were removed after the completion of the work. The end towers were 1,950 ft. apart and rested on concrete pedestals. The "A" frame divided the cableway into four independent units operated by four 40 h. p., double drum, Florey engines with a carrying speed of 800 ft. per minute. The contractors maintained an independent organization and plant layout on each side of the river, material being received on the New Jersey side from a switch connection with the N. Y. S. & W., and on the Pennsylvania side from the old line of the D. L. & W. Sand cars were dumped from a trestle into storage piles and the sand placed in elevated bins near the mixers by derricks operating clam shell buckets. Stone was hauled from the railroad excavations or waste banks by wagons to crushers located near the mixers and the crushed stone elevated to bins by bucket conveyors. Sand and stone were conveyed to the mixers by 24 in. gage cars. Each mixing plant consisted of two one yard Smith mixers located directly below the cableway.

A large part of the work was carried out on double shifts and an electric generating plant was installed to furnish light for night work. While concreting certain portions of the main arch rings concrete was placed continuously for three days and two nights and each section of the floor system required a continuous 24 hour run. This structure required 51,376 cu. yds. of concrete and 627 tons of reinforcing steel.

The concrete used on the cut-off was of three classes, known as "A," "B" and "C." "A" concrete was a 1:2:4 mixture, used only for thin walls and reinforced slabs; "B" concrete was a 1:3:5 mixture, used for arch rings and all work where other classes were not specified; and "C" concrete was the same mixture as "B" with two man stone bedded in it, used in massive piers, abutments and walls.

The structures were designed and built under the direction of Lincoln Bush, formerly chief engineer, and G. J. Ray, now chief engineer of the D. L. & W. F. L. Wheaton was engineer in charge of construction.

CENTRAL LONDON RAILWAY, ENGLAND.—The Central London Railway bill proposes to authorize the construction of railways from Shepherd's Bush through Chiswick to a junction with the London & South Western Railway at Gunnersbury, and to sanction working agreements, etc., to be made with the London & South Western, and the raising of additional capital for necessary expenditures.

RAILROAD ACCIDENTS, THEIR CAUSES AND REMEDY.*

BY D. F. JURGENSON,

Engineer Minnesota Railroad and Warehouse Commission.

Having found the fundamental causes of preventable accidents, the problem in hand is to accomplish their removal. It may be said in this connection that there is probably no industry in existence which depends so largely upon the human element for its safe operation as does a railway system; also in none of the ordinary walks of life are employees so well compensated for services rendered as are, generally speaking, those of American railways. Their hours of labor and rest have also been regulated by legislation to their advantage. The human equation is manifestly the most important element for consideration, and probably the most intricate to solve.

In our effort to eliminate the causes of collisions we should confine ourselves strictly to questions which are pertinent to the problem. In my judgment the wreck-resisting qualities of steel and wooden cars should not enter into consideration, because to anticipate the continuation of this feature of railroad operation, with a view toward the construction of wreck-proof cars and equipment, would be equivalent to a suggestion to the public that they should not expect to obtain satisfactory relief from preventable railroad accidents.

A notable feature in practically every report of collisions is the recital that one or several employees failed to do something which they should have done, and if they had obeyed the rules of the company the collision and consequential casualties would not have resulted. In this regard there is a marked contrast in sensibility to duty and appreciation of responsibility to society between the railway employees of this country and those of European railways. Whenever the European railway employee fails in performing his prescribed duty in train operation, and his failure of duty results in death or injury to persons, he is held accountable to the state, and it is an interesting fact that there are even less fatalities in connection with the operation of railways in Germany than with that of the agricultural pursuits of that country.

NECESSITY FOR AUTOMATIC TRAIN CONTROL NOT ESTABLISHED.

The necessity for automatic control of trains is not established until we have exhausted all means of prevention for errors in train operation now at our command. Some justification will then exist for seeking other fields for a remedy.

The automatic train-control device, if its realization was within the range of possibility, would at the very best be only an auxiliary to and of secondary importance to the signal system. This is so because past experiences have proven that practices not essential to the safe operation of trains are, as a general rule, not given the careful attention that the primary measures receive.

Except, perhaps, in a very few conceivable special cases, it is a question whether grave danger does not lurk in the introduction of a mechanical means that tends to make an automaton of a railway employee. This device is likely to make the employee careless of the responsibilities which he has assumed. It may cause him to feel that he is a mere supernumerary who has been practically relieved of responsibility in the handling and control of the train, vigilance over track, signals, flags, and in fact will, to a certain extent, encourage the omission of many of the duties and requirements so essential and necessary to insure the maximum of safety in train operation.

The automatic train-control device might shift the responsibility of safe train operation from the high-grade and long-experienced engineman or train operator to the less experi-

*Abstract of paper submitted as the Report of the Committee on Safety Appliances at the annual convention of the National Association of Railway Commissioners, Washington, D. C., November 19-22, 1912.

enced maintainer of mechanical devices. The successful working of any piece of mechanism is solely dependent at all times on the hand and mind creating it, so it must of need follow if the human agency fails, either directly as in the first instance or indirectly as in the second case, a calamity naturally will result.

Even if we were to realize the ideal automatic mechanical control of trains, it would still be extremely doubtful if such beneficial results could be obtained from the automaton as would be possible of attainment from the best efforts of the human agency, because it has been well demonstrated in the past that the skill of the human hand is capable of producing results which cannot be obtained by the most accurate machinery. No system of mechanical safeguards can be devised that will dispense entirely with human responsibility. Man's genius, with all its vast accomplishments in mechanical perfection, has not yet succeeded in developing the "fool proof" machine, but in every operation there appears at some point the dominating influence of the human mind. Let it relax or waver for an instant and all mechanical perfection is at naught.

AMERICAN RAILWAYS SUPERIOR IN MECHANICAL EQUIPMENT.

No railways anywhere are better equipped with mechanical devices for safeguarding human life than are the railways of this country. Cars and locomotives of the most modern construction, equipped with air brakes of the most efficient design, are in general use. Highly perfected automatic signal systems designed to preclude the possibility of collisions are in use on many lines. Their use is being extended, although not so rapidly as might be. Yet, with all these mechanical measures, lives are snuffed out by the score because some human mind failed. With all our perfection in this direction it appears as though we are encouraging carelessness among employees through overconfidence in mechanical perfection.

It is doing the American employee an injustice to contend that he is inferior, mentally and physically, to his European brother, and therefore that it is necessary to devise mechanical means to perform the services society is entitled to and which the employee is in duty obligated to render. If it is possible for the European railway manager, the American manufacturer, business man, contractor, and the government to obtain absolute reliability and precision from their employees, it ought not to be impossible for the American railway companies to get the same attention to duty and precision from their employees.

The railway employee should understand that a railway is a quasi-public corporation, and that when he accepts employment with it he becomes a quasi-public servant, and owes the same duty and responsibility to society as the company that employs him.

Since the foregoing statistics show that human fallibility is responsible for 59.7 per cent. of the deaths and 57.4 per cent. of the casualties resulting from all accidents for the period under consideration, it is apparent that serious investigation must be made to find an effective remedy. This is especially true since it has been demonstrated that it is not impossible to obtain reliability and precison from such employees in other countries and from employees in the other industries of this country.

There should be closer working relations between the managers and employees of railways for the purpose of encouraging open and free discussion on the subject of safety. The problem of making men trustworthy and dependable, if approached in the right direction, will not be found the hopeless task it is often assumed to be. Some of the railway companies have already formed "safety committees," with this very object in view. Their slogan is "safety first." They co-operate with all employees in devising measures of safety for the protection of life and limb in all branches of railway operation, and methods of this kind should be extended and encouraged.

RAILWAY EMPLOYEES SHOULD BE AMENABLE TO STATE.

What has been accomplished by Germany and other European countries in checkmating preventable accidents in railroad operation by making railroad employees amenable to the state for faithful attendance to and performance of their duties, might well be done in this country. Thus far, however, when effective disciplinary measures have been suggested as a remedy for human fallibility or carelessness in railroad operation, the difference in the sociological and political conditions existing here have been set forth as an insurmountable obstacle. Even though a majority of the European countries are in advance of us on this question, a start has only been made in the direction of eliminating the human equation from railroad operation. Can it be that the American people, the most efficient on earth, should continue to be led by Europe? A new idea cannot be perfected without some experiment, and until an honest attempt is made to find out how far the methods in vogue in the European countries may be relied upon in this country, it will not be known to what extent sociological and political conditions enter as factors into this problem.

The operation of railway trains is fast developing into an important and superior vocation, and all right-minded employees are beginning to realize the necessity for the introduction of effective means to protect them from the dangers attendant on the negligent acts of incompetent, careless or indifferent employees. It is conducive to their own interests and safety to encourage and advance such projects.

To accomplish this purpose, it may be necessary for the state to go beyond the corporate entity and its executive officers and hold each individual employee responsible for the proper and safe performance of his individual duty. This may be brought about in many different ways, and it is suggested that it may be effected in the following manner:

Employees engaged in train operation should be required by law to serve an apprenticeship of a sufficient duration to qualify themselves for the position they seek. Before the applicant is permitted to serve in any capacity in train service, he should be examined by a competent state board of examiners as to his physical and mental qualification. Such examinations and tests should be graduated so as to meet the requirements of the different grades of the service, and a license must define the kind of service the applicant may perform. The state must reserve the right to revoke the license for good cause.

Many of the states have for a number of years been enforcing this very idea against the practitioners of medicine, lawyers, dentists, undertakers, electricians, horseshoers, plumbers, stationary enginemen, barbers, and others for no other purpose than to protect society, and excellent results have been secured. As far as the public is concerned it is difficult to understand how the ability and requirements of the doctor, pharmacist, dentist, and others are of greater importance to society than those of railway employees, and if it is possible to reduce indiscretions and incompetency in the classes mentioned by effective state legislation, it should not be difficult to extend similar legislation to railway employees.

The lack of uniformity and the varying degrees to which state laws affecting railroad operation are enforced in the different states is very marked. The measure of safety which the public is demanding from errors in railroad operation cannot be expected to be realized without uniform and concerted action on the part of the different states whose duty it is to care for the public interests in this respect. The advisability and fairness of some of the state laws now existing and affecting train operations are also open to question.

Because of the confusion which now exists in the different state laws, it appears that both the interests of the public and the railway companies in the matter of safety from errors in railroad operation would be materially advanced if all legislation pertaining to railroad operation was made uniform.

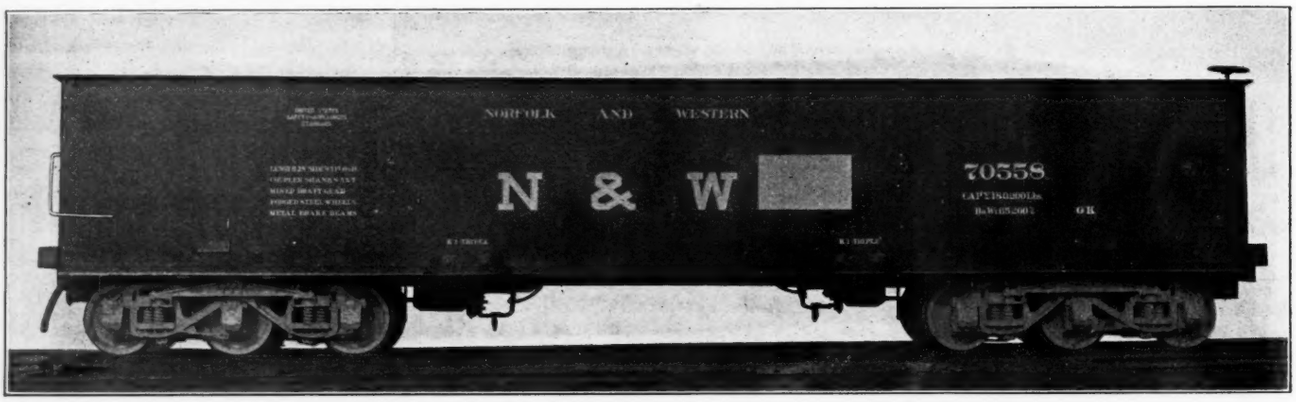
NINETY-TON HIGH SIDE GONDOLA CAR.

Developed on the Norfolk & Western and Equipped With Specially Designed Six-Wheel Equalized Trucks.

Cars larger than 120,000 lbs. capacity, if mounted on four-wheel trucks, involve pressures on the journal bearing which cause a large increase in the troubles with wheels and axles, as well as requiring much closer attention to prevent hot boxes. It therefore seems advisable to use six-wheel trucks under cars of extra large capacity. A six-wheel truck, as constructed for passenger cars, has been considered too expensive and complicated for satisfactory use in freight service, and with the exception of a few special cases, has not been so employed. When cars as large as 90-ton capacity, considered in connection with the usual 10 per cent. overload requirement, are to be built, a six-wheel truck is practically compulsory, and in connection with the design of such a car on the Norfolk & Western, the problem was solved by the development of an entirely new type of six-wheel truck, which permits the use of the ordinary 5½ in. x 10 in. M. C. B. journal box, while at the same time the weight is properly equalized and the truck is given the necessary flexibility.

These cars are of the high side gondola type and measure 9 ft. 6 in. in width, 6 ft. 6½ in. in height and 45 ft. 6¼ in. in length on the inside of the body. This gives a cubic capacity of 2,829 cu. ft. level full, and 551 cu. ft. in a 30 deg. heap, making a total of 3,380 cu. ft. Pocahontas run of mine coal is taken at 58.85 pounds to the cubic foot. The first load of coal hauled in the car was 95 tons, with some corners not quite filled out. The maximum outside dimensions are 48 ft. 4⅞ in. over bumping blocks, 10 ft. 4½ in. to the top of the side of the light car, 11 ft. 1 in. to the top of the brake shaft and 10 ft. 4½ in. extreme width over the body. The cars are provided with eight small drop doors in the floor, which are operated by a simple type of winding chain and shaft mechanism. The design is of the continuous center sill type. Cross beams or diaphragms are introduced to prevent deflection of the center sills, which, in a car of this length, would prove serious. This results in transmitting the load to the sides of the car which carry it, as plate girders, to the bolsters, whence it is transferred to the center plates. The stakes are on the inside and while interfering to a limited extent with lading other than coal, ore, or similar material, have a number of advantages. With outside stakes, the punching of the upper flange of the side of the car for rivets detracts materially from the strength of the section, this portion being in tension; while with inside stakes the rivet holes are on the compression side of the member. It has also been possible, with inside stakes, to do away with body cross ties, which are undesirable and form a fertile source of repair bills. Inside stakes are of particular advantage in this case, inasmuch as they form the means of powerful side stiffeners near the top chord angle of the side plates. As this car has been designed for use in a dumping machine, it will be readily seen that such construction is necessary.

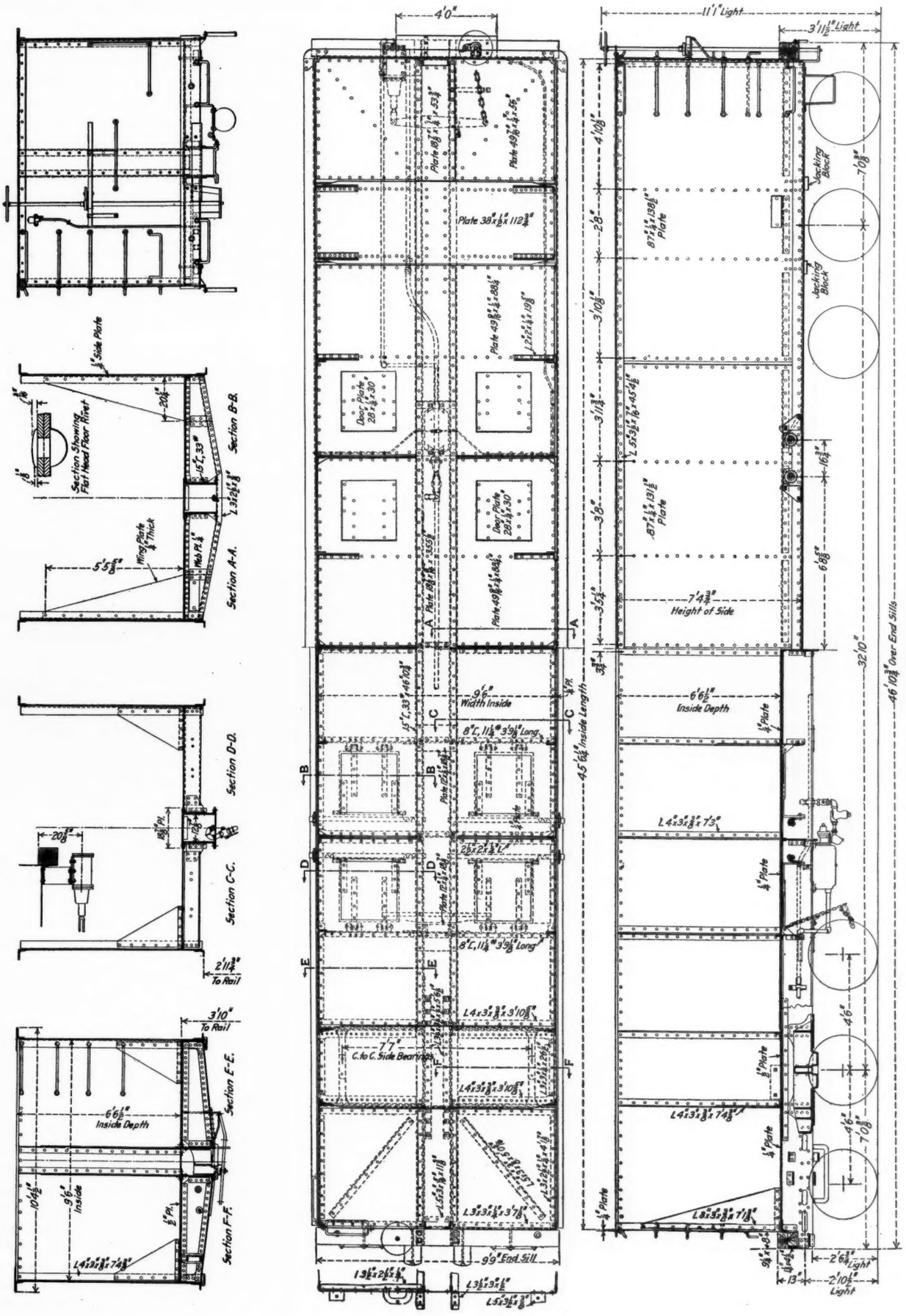
Commercial shapes are largely used, special castings being incorporated at a few points only. The center sill consists of two 15 in. 33 lb. channels which are continuous for the full length over end sills. These are set 12⅞ in. apart with the flanges extending outward and a 5/16 in. top cover plate extends continuous between the bolsters. The edges of the ¼ in. floor plates extend under this cover plate and are secured to the center sills by the same rivets. At the double body bolster there is a ½ in. plate 38 in. in width, and extending across the car, which forms the floor at this point. Between this and the end of the car the center sill cover plate is ¼ in. thick. At the bolster the center sill is reinforced at the top by 3½ in. x 3½ in. x ½ in. angles arranged as shown in the illustration. The three cross bearers each consist of a 3 in. x 2½ in. x ⅜ in. angle continuous under the center sill and secured to the bottom of the side posts at either end. They also include a ¼ in. web plate on either side between the center sill and side. This plate is made in two parts, the outer end for a distance of 20¼ in. consisting of an extension on the wing or gusset plate which is carried nearly to the top of the sides. The remainder is a properly shaped plate which extends only to the floor. The joint between the two is made with a splice plate ¼ in. thick. The top member of the cross bearer consists of two 2½ in. x 2 in. x ¼ in. angles extending between the center sill and the side plate. The floor plates are of such a size that the joints come at the cross bearers and the edges are riveted to the angles.



Ninety-Ton Gondola Car Mounted on a New Design of Six-Wheel Truck.

Midway between the cross bearers and also between them and the bolsters are floor beams, consisting of 8 in. 11¼ lb. channels with the outer ends riveted to the bottom of the side posts and the inner ends secured to the center sills through the medium of ¼ in. gusset plates and angles fastened on the webs of the center sill channels. The smaller wing or gusset plates are located above these floor beams and consist of triangular ¼ in. plates about 28 in. wide at the bottom and about 31 in. high riveted to the side posts and secured on top of the floor plates by angles of the proper length, the rivets holding the angles also extending through the flanges of the channels which form the floor beams. At both the floor beams and cross bearers there is a short reinforcing angle riveted to the top cover plate of the center sill, which is also the floor plate.

In view of the large weight concentrated at the center plate it was necessary to design a bolster of unusual strength and

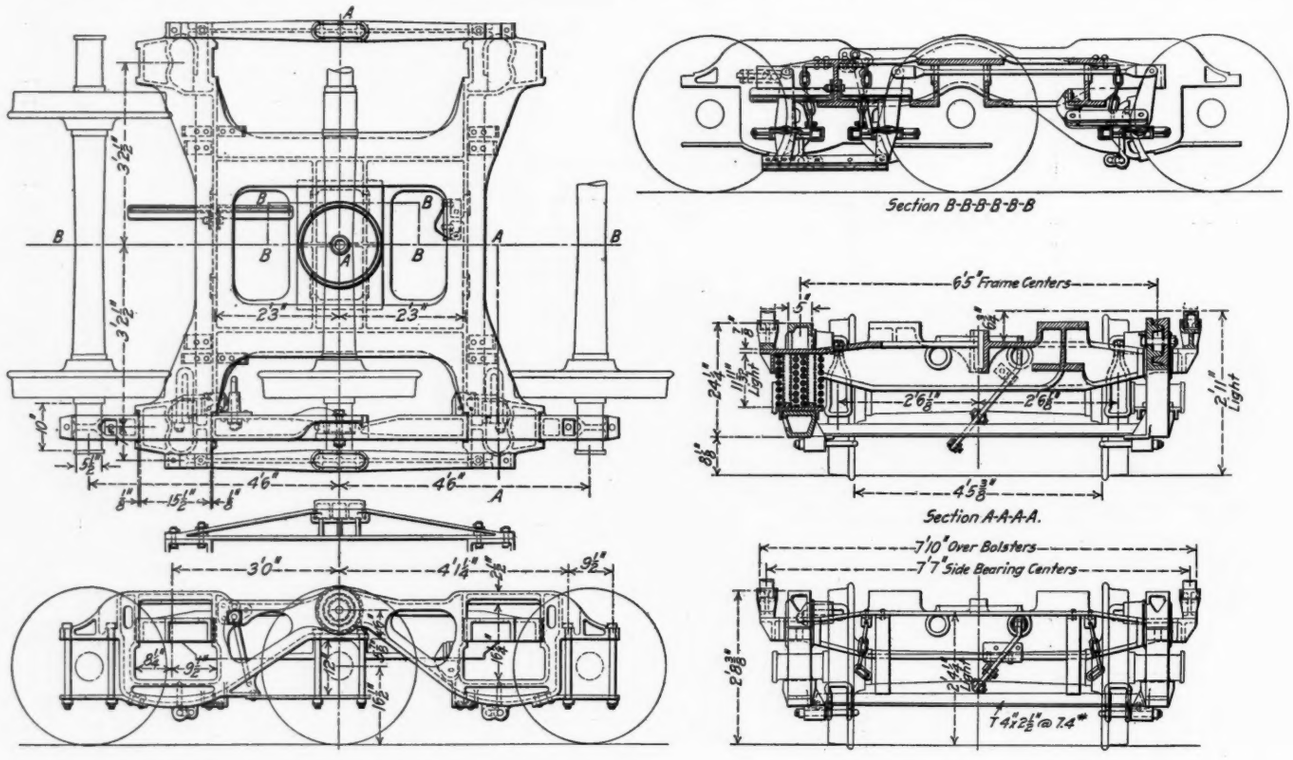


Ninety-Ton, High Side, Gondola Car Mounted on a New Design of Six-Wheel Truck; Norfolk & Western.

rigidity which would properly convey the load from the side girders, which carry the greater portion of it. Practically two bolsters, set 36 in. apart, have been employed and a large casting fitted between the center sill channels connects the two and includes the center plate. Each of these bolsters consists of a ½ in. web plate and a pair of 4 in. x 3 in. x ⅜ in. angles at the top. Similar angles at the bottom, which in both cases extend only from the side plate to the flange of the center sill channel, are also used. A ¾ in. plate, 16 in. in width at the center and tapering to a width of 8½ in., extends under the center sill and the center plate casting and is riveted on either side to the flanges of the bottom angles. At the junction of the side plate and each of the bolsters there is a jacking casting, formed to fit around the bottom end of the side post and strengthen the construction at this point. This gives four jacking points at each end of the car. A ½ in. top cover plate of sufficient width to include both parts of the double bolster extends across the car and is secured to the side plate by an angle. The side bearings are attached to angles. The end sill is of oak 8 in. x 9¼ in. and the center sill channels are cut out at the top sufficient to allow its introduction. The end sheet of the car extends behind the end sill which is also reinforced by the end posts and the angle to which the floor plates are secured.

The car has a Miner friction draft gear with Miner attachments. It will be seen that the gear is attached directly to the center sills with the usual reinforcing castings on the webs and that the coupler yoke passes below the wooden end sill, the carrier iron being bolted to the bottom flanges of the center sills. The rear casting of the draft gear has a minimum clearance of ⅛ in. from the extension on the center plate casting. The center of the line of draft is 3¾ in. above the bottom of the center sill channels.

Each car has two sets of brake rigging, including auxiliary reservoirs, triple valve, brake cylinder, etc. The reservoirs are supported below the center sills just inside of the truck and the train line passes between the two center sill channels for the dis-



Six-Wheel Equalized Truck with Journal Boxes Secured to the Side Frames; Norfolk & Western.

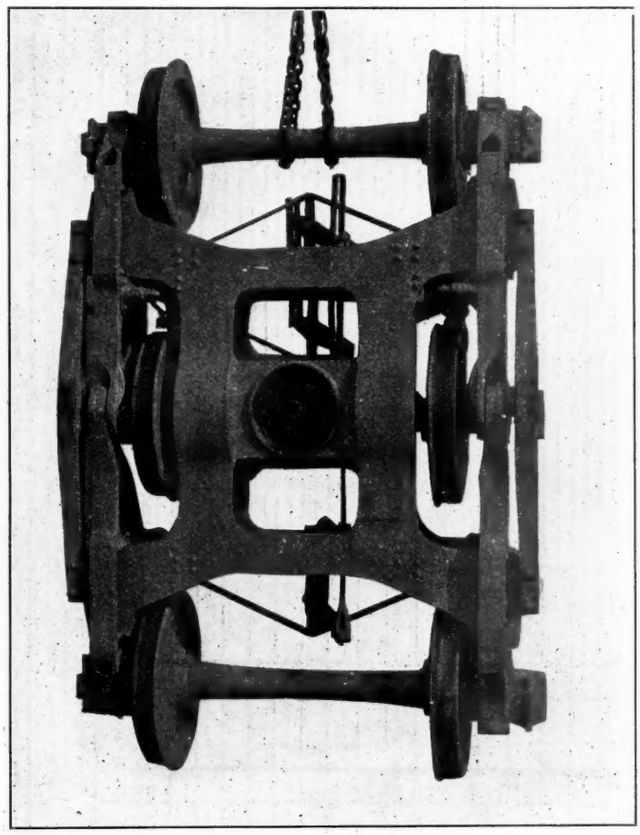
a properly shaped casting forming a bridge between the two bolsters and are located at a radius of 3 ft. 9½ in. from the truck center.

A large proportion of the load is carried by the sides of the car which consist of ¼ in. steel plates 87 in. in width and 138 in. in length. The vertical joints between these sheets are made by ¼ in. splice plates on the inside, and the double stakes at these points are set in enough to allow for them. This plate girder, of which the side plates form the web, has a 5 in. x 3 in. x 7/16 in. angle at the bottom with the flange extending outward, and a 5 in. x 3½ in. x 7/16 in. angle at the top. Both angles are continuous for the full length of the car. There are no diagonal braces and the plate is stiffened by the 4 in. x 3 in. x ⅜ in. angles forming the stakes, which are spaced as shown on the drawings. These angles continue to the bottom of the side plate and are fastened to the cross bearers and floor beams. As before mentioned the wings or gussets of two different sizes form the principal source of stiffness for these girders.

The construction at the end is practically the same as at the sides. The corner posts, however, are 3½ in. x 3½ in. x ⅜ in. tance between the bolsters. At the bolsters and to the end of the car it runs outside of the sills. The brake cylinders are located just under the end sill, there being one at either end of the car connected to the adjacent triple valve and reservoir. The hand brake is located on the opposite side of the car from this cylinder and connects to the opposite end of the same brake lever. This location of the brake cylinder is somewhat in the nature of an experiment and arrangements have been made for placing the cylinders between the trucks at about the usual locations if the present location should prove unsatisfactory.

A six wheel equalized truck without pedestals is a novelty and has been developed for use on this car by W. H. Lewis, superintendent of motive power and John L. Pilcher, mechanical engineer. It consists of a cast steel side frame in two parts and of peculiar shape arranged to carry three journal boxes at 4 ft. 6 in. centers. Directly above one of the journal boxes the castings are arranged for a swivel connection. In these two castings the openings for the ends of the bolster and for the group of coil springs are spaced at 3 ft. centers from the center axle, bringing them 18 in. from the outer axles. One of the illustra-

tions clearly shows the form and arrangement of the double cast steel bolster which carries the center plate. This rests on four nests of three double coiled springs each and has an extension beyond the side frame to allow the attachment of a bridge which carries the side bearing at the center of the truck. This bridge is bolted to the bolster extensions. Each group of springs consists of three nests of an outside coil of 1¼ in. diameter wire, 5 in. outside diameter, with an inside coil of 9/16 in. wire, 2¼ in. outside diameter. The springs work at 40,000 lbs. stress in the bar when the car is loaded to a 10 per cent. overload. The free height is 11½ in. with a total deflection, free to solid, of 1¾ in. The swivel joint in the side frame is so formed as not to give any shearing action on the bolt. This arrangement is shown in the sectional view through the center of the truck. This view also shows that the bolster is not as heavy as it might appear in the photograph. There are two 4 in. x 2½ in. tees bolted to suitably formed lugs on the bottom of the side frames and located midway between each of the pairs of wheels. These take the place of sand planks which are not feasible when the bolsters are arranged in respect to the wheels as they are in this case. It is possible that these cross ties may be omitted altogether. Tests will be made to determine this.



Top View of the New Six-Wheel Freight Car Truck.

The brake rigging on each truck is comparatively simple and arranged in a manner similar to a six-wheel passenger truck. Designs for carrying the brake beams from either the side frame or the bolsters have been prepared. The one given here shows the former. This truck has been patented by Messrs. Lewis and Pilcher.

The weight of the two trucks alone is 29,800 lbs., and of the car complete with trucks is 65,200 lbs., giving a total weight with lading, including a 10 per cent. overload, of 263,600 lbs., or an average weight per axle at the rail of slightly less than 44,000 lbs. With a 10 per cent. overload the proportion of revenue lading to total weight will be about 75 per cent., and it will be over 73 per cent. without the overload. It is expected that it will be possible to reduce the weight slightly, especially that of the trucks in later cars.

The entire car has been carefully designed with a view to ease of manufacture. To this end all plates and shapes are laid out for multiple punches, and care has been taken that if the plates, etc., come within the customary variations in shearing, no reshearing will be necessary. Duplication of parts has been carefully considered with good results.

OPERATING ORGANIZATION ON THE CANADIAN PACIFIC.

The Canadian Pacific lines west, including 7,000 miles extending from the Great Lakes to the Pacific coast, are divided for operating purposes into four divisions with a general superintendent in charge of each. These divisions are subdivided into districts in charge of superintendents. The vice-president and general manager in charge of operation on the lines west is assisted by an assistant general manager, chief engineer and other staff officers. The chief engineer approves standards and engineering practice and has direct charge of the building of new lines, reporting to the vice-president. The assistant general manager is assisted by a superintendent of motive power, engineer of maintenance of way, superintendent of car service and other staff officers. On each division the general superintendent is assisted by a division engineer, master mechanic and car service agent, the latter performing the usual duties of the superintendent of transportation, a title which is not thought to be as good as car service agent. Each superintendent has on his staff a resident engineer, district master mechanic, trainmaster, master carpenters, roadmasters, chief train despatchers, etc. The same general plan is followed in offices of all grades of having one clerical staff for the entire office and a general standard for office arrangement has been worked out which has effected a considerable saving.

The accompanying floor plan of the general superintendent's office in Winnipeg illustrates the general design of division and district offices. There is a private office for the general superintendent with smaller private offices for his assistants, and a single large room for the clerical force. A letter coming to the general superintendent, master mechanic, division engineer or car service agent, would be opened in the clerical office, most of the correspondence on all subjects being addressed to the general superintendent. If the letter treated of engineering, a reply would be written by the division engineer and placed before the general superintendent for signature. If mechanical, a reply would be dictated by the master mechanic, and if it treated of transportation, it would be handled by the car service agent. This practice enables the general superintendent to take advantage of the technical knowledge of his assistants and at the same time know exactly what is being done in each of the departments on his division and to maintain general supervision over all of the work. It also eliminates the large amount of inter-department correspondence common under the departmental organization. This system was introduced about the time that Major Hine started the unit system of organization on the Union Pacific. It is thought by the Canadian Pacific officers that the practice of allowing the technical men to retain their old titles adds prestige to their position which is not obtained in a system which calls them all assistants. The use of a single chief clerk for the entire office eliminates duplication of clerical work and friction between the chief clerks of the various departments. The clerical office is divided into departments which handle the statistics and filing for each of the departments of the division. Stenographers are used in common by the officers and all correspondence is kept in a common file.

It may be noted that on the western lines every superintendent is required to write a weekly news letter to the general superintendent. This letter, which is mailed every Saturday night, tells briefly what the weather has been, how traffic is moving,

(2-10-11 23404) FORM 695 A

CANADIAN PACIFIC RAILWAY COMPANY

_____ District _____ Division

Comparative Statement of Expenses, Month of _____ 191__ and 191__

ACCOUNTS	Month of ____ Current Year	Corresponding Month Preceding Year	Increase or Decrease Amount	Increase or Decrease Per Cent.	EXPLANATION OF INCREASES AND DECREASES (*See Note*)	New Lines (see note at foot) Line	Line
MAINTENANCE OF WAY AND STRUCTURES							
1. Superintendence							
2. Ballast							
3. Ties					____ Ties put in Track, 191__ Average Cost per Tie ____ 191__ ____ " " 191__ " " " ____ 191__		
4. Rails					____ ft. of New Rails laid 191__ ____ ft. Second-hand Rails laid, 191__ ____ " " 191__ ____ " " " 191__		
5. Other Track Material					New Schedule represents increase of $____		
6. Roadway and Track							
7. Removal of Snow, Sand and Ice							
17. Docks and Wharves							
18. Roadway Tools and Supplies							
22. Injuries to Persons							
23. Stationery and Printing							
25. Other Expenses							
26. Maintaining Joint Tracks, Yds. & O. F.—Dr.							
27. " " " " —Cr.							
Total Maintenance of Way and Structures					Mileage of District, current month ____ miles " " corresponding month previous year ____ " Total M. W. & S. per mile of Road, current month $____ " " " " " " corresponding month preceding year $____		

NOTES.—
Give reference to special Debits or Credits included in either year.
"NEW LINES"—Show in these columns all expenses for new lines included in current year's figures for which there were not any corresponding charges in preceding year.
This form must reach the office of Vice-President not later than morning of 26th of each month.

_____ *Superintendent.*
(Form should be signed by Superintendent personally.)

Form for Recording Monthly Operating Costs on Canadian Pacific—Maintenance of Way and Structures.

(2-10-11-23404)

FORM 695 B

CANADIAN PACIFIC RAILWAY COMPANY

_____ District _____ Division

Comparative Statement of Expenses, Month of _____ 191__ and 191__

TRAIN MILEAGE (Figures furnished by Auditor of Disbursements)	Month of Current Year	Corresponding Month Preceding Year	Increase or Decrease (Red) Number	Increase or Decrease (Red) Per Cent.	LOCOMOTIVE MILEAGE (Figures furnished by Auditor of Disbursements)	Month of Current Year	Corresponding Month Preceding Year	Increase or Decrease (Red) Number	Increase or Decrease (Red) Per Cent.	ACTUAL GROSS TON MILEAGE (Figures furnished by Auditor of Disbursements)	Month of Current Year	Corresponding Month Preceding Year	Increase or Decrease (Red) Number	Increase or Decrease (Red) Per Cent.
Passenger					Passenger					Passenger				
Through Freight					Through Freight					Through Freight				
Way Freight					Way Freight					Way Freight				
Mixed					Mixed					Mixed				
Special					Special					Special				
					Total Road Loco. Mileage									
					Switching—Terminal									
					Switching—Yard									
Total Train Mileage					Total Loco. Mileage					Total A. G. Ton Miles				

ACCOUNTS.	Month of Current Year	Corresponding Month Preceding Year	Increase or Decrease Amount	Increase or Decrease Per Cent.	EXPLANATION OF INCREASES AND DECREASES (*See Note*)	New Lines (See note at foot) Line	Line
TRANSPORTATION CHARGES							
66. Superintendence							
67. Dispatching Trains					New Schedule represents increase of $_____		
68. Station Employees					New Schedule represents increase of $_____		
70. Stock Yards and Grain Elevators							
71. Coal and Ore Docks							
72. Station Supplies and Expenses							
73. Yardmasters and their Clerks							
74. Yard Conductors and Brakemen					New Schedule represents increase of $_____		
75. Yard Switch and Signal Tenders					New Schedule represents increase of $_____		
76. Yard Supplies and Expenses							
77. Yard Enginemen					New Schedule represents increase of $_____		
79. Fuel for Yard Locomotives					Increase or Decrease, excluding change in price _____ % _____ Change in price represents {Increase / Decrease} of $_____		
80. Water for Yard Locomotives							
83. Operating Joint Yards and Terminals, Dr.							
84. do do do do Cr.							
86. Road Enginemen					New Schedule represents increase of $_____		
88. Fuel for Road Locomotives					Increase or Decrease, excluding change in price _____ % _____ Change in price represents {Increase / Decrease} of $_____		
109. Injuries to Persons							
110. Operating Joint Tracks, Dr.							
111. do do do Cr.							
Total Transportation Charges Total Maintenance of Way and Struct., Form 695A					Total Transp'n Charges per 10,000 A. G. Ton Miles {Current month $_____ / Corresponding month preceding year $_____} Total Transportation Charges per Train Mile {Current month $_____ / Corresponding month preceding year $_____}		
TOTAL EXPENSES							

NOTES.—
It is expected that when "Train Mileage," "Engine Mileage" or "Gross Ton Mileage" show decreases, the accounts affected thereby will show corresponding decreases, otherwise an explanation should be given.
Give reference to special Debits or Credits included in either year.
"New Lines."—Show in these columns all expenses for new lines included in current year's figures for which there were not any corresponding charges in preceding year.
This form must reach the office of Vice-President not later than morning of 26th of each month.

_____ *Superintendent.*
(Form should be signed by Superintendent personally.)

Form for Recording Monthly Operating Costs on Canadian Pacific—Transportation Charges.

and recounts any unusual occurrences. It also gives the earnings at principal stations, the bank clearings at important cities, a brief statement as to crop conditions, new industries that may be productive of traffic, the developments being made by competing railways and any other news that may be of value in promoting economy or securing new business. These letters are summarized by each general superintendent and forwarded to the assistant general manager. This system of reports has been

(8-12-11-25636) Form 1908 March

CANADIAN PACIFIC RAILWAY COMPANY

COMPARATIVE STATEMENT OF MECHANICAL DEPARTMENT EXPENSES

_____ District _____ Division. Month of _____ 191_____

NAME OF ACCOUNT	Actual Labor & Material 191	Actual Labor & Material 191	INCREASE	DECREASE	EXPLANATION OF INCREASE OR DECREASE	*Shop Expense, Scrap Credits, Miscellaneous & Indirect Charges 191	*Shop Expense, Scrap Credits, Miscellaneous & Indirect Charges 191
MAINTENANCE OF EQUIPMENT							
Superintendence—Motive Power Dept.							
Superintendence—Car Dept.							
Steam Locomotives—Repairs							
PASSENGER TRAIN CARS - REPAIRS							
Parlor Cars							
Sleeping "							
Dining "							
Passenger, 1st & 2nd Class "							
Baggage, Mail & Express "							
Tourist & Colonist "							
Official "							
Refrigerator Express "							
Inspecting Passenger Train "							
Total Repairs Passenger Train "							
FREIGHT TRAIN CARS—REPAIRS							
Box Cars							
Flat "							
Caboose "							
Foreign "							
Inspecting Freight Train "							
Total Repairs Freight Train "							
WORK EQUIPMENT -REPAIRS							
Locomotives							
Cars							
Other Work Equipment							
Inspecting Work Equipment							
Total Repairs Work Equipment							
Floating Equipment -Repairs							
ROLLING STOCK WRECK DAMAGE							
Locomotives							
Passenger Train Cars							
Freight Train "							
Work Equipment "							
Total Rolling Stock Wreck Damage							
SHOP MACHINERY AND TOOLS							
Repairs							
Renewals							
Total Shop Machinery and Tools							
Injuries to Persons							
Stationery and Printing							
Other Expenses							
Maintaining Jt. Equipm't at Term'ls—Dr.							
" " " —Cr.							
TRANSPORTATION EXPENSES							
Engine House Expenses—Yard							
Lubricants for Yard Locomotives							
Other Supplies for Yard Locomotives							
Operating Jt. Yds. & Terminals—Dr.							
" " " —Cr.							
Engine House Expenses—Road							
Lubricants for Road Locomotives							
Other Supplies for Road Locomotives							
TRAIN SUPPLIES AND EXPENSES							
Cleaning Cars							
Heating "							
Lighting "							
Lubricating "							
Icing & Watering "							
Other Expenses							
Total Train Supplies and Expenses							
Total Actual Charges							
* Shop Expense, Scrap Credits, Miscellaneous and Indirect Charges (per detail)							
TOTAL							
NET INCREASE OR DEC.							

Form for Recording Monthly Operating Costs on Canadian Pacific—Mechanical Department Expenses.

found very valuable in keeping the general superintendent and vice-president in close personal touch with the conditions on their territories.

Each superintendent has an accountant and the necessary timekeepers. The accountant is required to furnish the superintendent a monthly statement of the detailed expenditures on his division. The forms used for these statements are reproduced herewith. These statements enable the superintendent to locate any unnecessary expense and to determine how he can best promote economies or reduce expenses in emergencies. Each superintendent is held responsible in a large measure for the financial showing made on his district. He is not asked to explain why operation was so costly, but to take immediate steps to remove the cause. These expense statements are forwarded monthly to the general superintendent who combines all the districts on his division and forwards them to the assistant general manager.

The present system of organization on the western lines of the Canadian Pacific has been worked out under the direction of George Bury, vice-president and general manager, to whom we are indebted for the above description.

Lancashire & Yorkshire Railway, England.—New railways are proposed at Southport, Bolton, Royton, Knottingley and Goole. The new Southport line will run from Ainsdale to Kew Gardens; the Bolton line will connect with the Liverpool & Bury and the Bolton & Preston lines; the Royton line will connect with the Royton branch and the Oldham, Rochdale & Royton line; the Knottingley line with the Askern branch and the Wakefield, Pontefract & Goole line; and the Goole line will connect with the Axholme Joint Railway. Widenings to be made at Liverpool, at Fazakerley and at Bolton are included in the plans, and it is intended to alter and enlarge Victoria station at Manchester.

LIMITATIONS OF COMMISSIONS' POWERS.

Supreme Court Decisions Repeatedly Hold That Commission's Orders Must Show the Evidence on Which They Are Based.

By H. T. Newcomb,
Of the Bar of the District of Columbia.

Prior to August 28, 1906, the date on which the Hepburn act took effect, the Interstate Commerce Commission was required to make a report in each case in which it issued an order and to embody in each report the findings of fact on which the order was based. In all subsequent judicial proceedings such findings were made *prima facie* evidence. This provision, except in the case of orders for the payment of money, was omitted from the revision of 1906, apparently for the reason that it was assumed that the effect of the new legislative command to all concerned to obey the commission's orders, without the intervention of judicial approval, transformed the regulative body into a legislative agency which, in consequence, became one that need not assign reasons for or justify its action. It seems to have been assumed, in giving form to this legislation, that Congress could not only delegate power over rates which it might have exercised directly, but that it had power, also, to exempt the agency on which it conferred the extraordinary administrative power of rate-making from the ordinary inquiries concerning the exercise of its power to which every administrative agency is subject, namely, whether, in a particular case, its action was in good faith, with honest and upright purpose, and reasonable according to the standards expressed or implied in the grant of authority.

This was surely a violent assumption, and, perhaps, there was nothing else in the Hepburn act so significant of the disregard, on the part of President Roosevelt and those who aided him in enforcing his will upon a reluctant Congress, of the limitations upon the power of legislative bodies to entrust to others powers partaking of the legislative character.

When a legislative body acts within the scope of its constitutional powers, there is no authority which can inquire whether it acted reasonably and in good faith or arbitrarily and with fraudulent purpose (although, of course, some constitutional powers are limited to reasonable exercise and, in such cases, the inquiry as to reasonableness is an essential part of the inquiry whether the power exists); or, stated differently, there is a conclusive presumption, which no evidence could overcome, that, when the legislature enacts that which it has power to enact, it has acted reasonably and in good faith. There is a similar presumption, but of lesser degree, in favor of the acts of administrative officers; but, in this case, whoever may attack the act is permitted, if he can, to overcome the presumption by showing that it was arbitrary, unreasonable, committed in bad faith or with an improper purpose. Congress cannot confer, upon any officer or agency of government, power to act arbitrarily, and hence the inquiry as to the nature of the act is essentially an inquiry whether it is within the grant of power.

> "It is not to be supposed that Congress would ever authorize an administrative body to establish rates without inquiry and examination; to evolve, as it were, out of its own consciousness, the satisfactory solution of the difficult problem of just and reasonable rates for all the various roads in the country." *Interstate Commerce Commission v. Cincinnati, New Orleans & Texas Pacific Railway*, 167 *U. S.* 479, 509.

In the much later case, *Interstate Commerce Commission v. Illinois Central Railroad* (215 *U. S.* 452), in a luminous and frequently cited paragraph closely connected with the assertion that, "Power to make the order, and not the mere expediency or wisdom of having made it, is the question," (215 *U. S.* 452, 470), the Supreme Court, speaking through the present Chief Justice, intimated that the question whether, "even although the order be in form within the delegated power, nevertheless it must be treated as not embraced therein, because the exertion of authority which is questioned has been manifested in such an unreasonable manner as to cause it, in truth, to be within the elementary rule that the substance, and not the shadow, determines the validity of the exercise of power," is essentially a part of the inquiry which seeks to determine whether "the administrative order is withn the scope of the delegated authority under which it purports to have been made." (215 *U. S.* 452, 470.)

In a still later case, *Interstate Commerce Commission v. Union Pacific Railroad* (222 *U. S.* 541) the Supreme Court, its unanimous judgment being expressed in an opinion by Mr. Justice Lamar, somewhat amplified the foregoing, holding that an order of the commission would not be final "if the commission acted so arbitrarily and unjustly as to fix rates contrary to evidence, or without evidence to support it; . . ." (222 *U. S.* 541, 547), and, further, in pursuance of the same thought, "Its conclusion, of course, is subject to review, but, when supported by evidence, is accepted as final; not that its decision, involving, as it does, so many and such vast public interests, can be supported by a mere scintilla of proof, but the courts will not examine the facts further than to determine whether there was substantial evidence to sustain the order." (222 *U. S.* 541, 547-8.)

From the foregoing declarations of a principle that needs only to be stated to approve itself to the understanding, to the observation in the just decided case of *United States v. Baltimore & Ohio Railroad* (*decision rendered on November* 18, 1912) that the orders of the commission cannot be sustained by facts not shown by testimony or by reports and records of which it is entitled to take notice and receive as evidence in the record, is but a short step and one that could not have been avoided. In the recent case Mr. Justice Holmes, speaking for the court, said:

> "We remark that it is stated in the commission's report that they base their conclusion more largely upon their own investigation than upon the testimony of the witnesses. It would be a very strong proposition to say that the parties were bound in the higher courts by a finding based on specific investigations made in the case without notice to them. *See Washington, ex rel. Oregon R. R. & Nav. Co., v. Fairchicld*, 224 *U. S.* 510, 525. Such an investigation is quite different from a view by a jury taken with notice and subject to the order of a court, and different again from the question of the right of the commission to take notice of results reached by it in other cases, when its doing so is made to appear in the record and the facts thus noticed are specified, so that matters of law are saved."

The reference to *Washington, ex rel. Oregon R. R. & Nav. Co., v. Fairchild,* in the foregoing is significant. That case came to the Supreme Court on writ of error to the Supreme Court of the State of Washington, which had decided against the claim of the railroad that its property was taken without due process of law and in contravention of the Fourteenth Amendment to the federal constitution by an order of the state railroad commission requiring certain track connections to be made with lines of other companies. After referring to the character of this order, the court, speaking by Mr. Justice Lamar, said:

> "Its validity could not be sustained merely because of the fact that the carrier had been given an opportunity to be heard, but was to be tested by considering whether, in view of all the facts, the taking was arbitrary and unreasonable, or was justified by the public necessities which the carrier could lawfully be compelled to meet. . . .
>
> "So that, where the taking is under an administrative regulation, the defendant must not be denied the right to show that, as matter of law, the order was so arbitrary, unjust, or unreasonable as to amount to a deprivation of property in violation of the Fourteenth Amendment." 224 *U. S.* 510, 523-4.

As it appeared that the state commission, when it made the order, did not have before it evidence sufficient to sustain the taking of property which it involved, and as in the subsequent

proceedings in the state courts no additional testimony was permitted, the judgment sustaining the order was reversed. The inference, otherwise possible, that this conclusion was in any degree controlled by the fact that the question arose in connection with an order requiring a physical connection to be made, rather than an order prescribing rates, is negatived by the fact that the first reference in support of the concluding sentence quoted above, was to *Chicago, Milwaukee & St. Paul Railway v. Minnesota* (134 *U. S.* 418), a rate case, that affirmed the principle expressed in the following frequently cited passage:

"The question of the reasonableness of a rate of charge for transportation by a railroad company, involving as it does the element of reasonableness both as regards the company and as regards the public, is eminently a question for judicial investigation, requiring due process of law for its determination. If the company is deprived of the power of charging reasonable rates for the use of its property, and such deprivation takes place in the absence of an investigation by judicial machinery, it is deprived of the lawful use of its property, and thus, in substance and effect, of the property itself, without due process of law and in violation of the Constitution of the United States; and in so far as it is thus deprived, while other persons are permitted to receive reasonable profits upon their invested capital, the company is deprived of the equal protection of the laws."

These extracts seem to support the view that not only would the Interstate Commerce Commission be usurping authority not within the scope of the grant of power under which it exercises all its lawful powers, if it should undertake to make an unreasonable or arbitrary order of any kind or one not sustained by evidence that it is entitled to consider, but that an attempt on the part of Congress to grant authority to make such an order, or to make any order under such conditions, would be unconstitutional and void.

The principle that every order of an administrative tribunal, federal or state, exercising rate-making power, must be sustained by a record containing evidence that the order is not arbitrary or unreasonable, and that those whom the order would bind must have notice of this evidence, was several years ago announced by the Court of Appeals of New York in *Saratoga Springs v. Saratoga Gas, Electric Light and Power Company* (191 *N. Y.* 123) as follows:

"It is also objected that any order made by the commission may be based, not only on the evidence and proceedings had at the public hearing provided by the statute as a perquisite for making any order fixing maximum rates, but on the *ex parte* statement of the officers, agents, and inspectors of the commission, of which a company may have no knowledge, and to controvert which no opportunity is afforded. We do not so construe the statute. . . . As we read the statute, the investigation and report of agents and inspectors are to follow the filing of any complaint, and to precede or to be made during the public hearing. . . . It is plain that no corporation could make its defense until it was clearly notified of what was charged against it, and the proof to support such charge was given. While the commission might not be bound by technical rules of evidence, still it was plainly intended that the whole proceeding should assume a *quasi-judicial* aspect. . . . The commission being empowered to subpoena witnesses and take testimony, its inspectors or agents could be required to appear and verify any reports made by them; or, if we assume that such reports could be received in the first instance without verification, the inspectors or agents could be compelled to attend at the instance of either party, and be examined as to the truth of the statements in their reports and their knowledge of the facts therein contained." 191 *N. Y.* 123; 18 *L. R. A.* (*N. S.*) 713, 724-5.

Apparently the recent expression of the Supreme Court of the United States, by Mr. Justice Holmes, sanctions the foregoing and indicates its complete application to the Interstate Commerce Commission. The extent of the change in methods necessary to meet this requirement is perhaps exaggerated by contrasting it with the following declaration of the latter commission, taken from its Twenty-second (1908) Annual Report.

"Practically every complaint, formal or informal, which comes before the commission requires examination of tariff files and statistical reports of the carriers for the purpose of determining whether or not the complaints are well founded and accurately stated. With the present unification of these several branches of the work such reports are obtained in very short time. In fact, *the information necessary to intelligent action by the commission can frequently be obtained from a verbal interview with the head of the appropriate division,* and in a great many instances no further research is necessary. In this connection it should be remembered that for the heads of its tariff and statistical divisions the commission has chosen practical railroad men.

. . . . . .

"Moreover, it must be remembered that *the commission can seldom, if ever decide a case merely upon the evidence presented to it.* In this respect it is radically different from a court. The ordinary court determines only the rights of the parties before it, but every decision of the commission involves the rights of parties who are not present. Any important readjustment of rates applies not only to the complainant, but also to all shippers under those rates, and frequently, as a commercial necessity, to carriers who are not before the commission in a particular case; and in addition to the evidence actually presented to the commission, it must consider the effect of a ruling in any given case upon carriers, shippers, or localities who are not represented. It is obvious, therefore, that the determination of almost every case requires consideration of conditions, tariffs, and statistics which are not presented to the commission, but which it must take notice of in order to faithfully perform its duty, and the proper expedition of the commission's work requires that these aids to the final determination of cases arising before it should be as easy of access as possible. It is, perhaps, not too much to say that not a single case arising before the commission could be properly decided if the complainant, the railroad, or the commission were bound by the rules of evidence applying to the introduction of testimony in courts."

Despite the foregoing, it is not believed that in many important cases the Interstate Commerce Commission has based final action upon mere verbal statements of its employees or even upon considerations of commercial policy not supported by the record actually before it. So far as it has actually assumed the right to act upon such considerations it is evident that its practice must be revised and can be revised without detriment.

It is proper to notice, in conclusion, the very superficial suggestion, not infrequently heard, that the acts of regulative tribunals are made more vulnerable to attack when they are accompanied by statements of the reasons by which they were prompted. Some one, whom the writer does not recall, advancing this view, quoted the remark of a famous magazine editor who said that when he rejected a manuscript he was always right, when he gave a reason for the rejection he was always wrong. It is true that the commission has, from the beginning, and pretty consistently, followed the plan plainly intended by the law, of stating rather fully the reasons for its orders and that, in the relatively very small number of instances in which these orders have been attacked in the courts and judicially condemned, the courts have, quite uniformly, found that the statement of reasons pointed to the error that had been made. But the decisions in *Washington v. Fairchild, supra,* and the other cases herein cited, clearly show that if no reasons had been given, the facts would have been examined and the error traced to its source in the contents, or in the omissions, of the record on which the commission acted.

Among the conservative conclusions suggested by the rule laid down by Mr. Justice Holmes in the recent case, and by the New York Court of Appeals in the Saratoga Springs case, is that the regulative process might be simplified and strengthened by restoring the requirement, abolished by the Hepburn act, that all orders of the Interstate Commerce Commission should be supported by reports containing the findings of fact on which they are based. There would then be at least a *prima facie* showing, carrying a strong presumption of authority, with which judicial inquiry concerning the legality of any of the commission's orders would begin.

North British Railway, England.—The North British Railway notice shows that the company is intending to construct 14 new railways for the purpose of giving additional facilities to the Lothian coal traffic, new railways in Linlithgow and Fife, and a pier at Arisaig. Power may be taken to restrict some of these proposed railways to the transportation of "such particular class or classes of traffic as the intended order may prescribe." It is also proposed to confirm agreements with the Caledonian Railway and the Edinburgh Corporation, to enable the Burntisland Harbor Commissioners to borrow and the company to advance further moneys, and to raise additional capital.

IMPRESSIONS OF GERMAN RAILWAY PRACTICE.

The Handling of Locomotives at Terminals, the Economizing of Fuel and the Care of Employees Are Notable Features.

By Henry W. Jacobs.

Of all the countries in Europe the traffic conditions most nearly approximating those of the United States are found in Germany. The methods there used in operating and handling locomotives will therefore be of interest to American railway officers. German passenger and freight trains and locomotives are heavier than those commonly found elsewhere in Europe, and while the most modern of the express and heavy freight locomotives are of considerable size and power, compared even with American standards, their weights and dimensions, of course, do not nearly equal those found in our largest locomotives, the primary limitations being the axle load allowed by the track and bridges and the clearance limits of tunnels.

The use of freight locomotives without a leading truck is quite common practice, but not to the extent prevailing in England where leading trucks are seldom used on freight locomotives. Tank locomotives are frequently used in both freight and passenger service, and almost universally in switching service. An example of the types of locomotives prevailing upon a dense traffic division of a German railroad is given in the following table:

Type.	Service.	No. of Locos.
0-4-0 (tank)	Switch	9
2-4-0	Passenger	2
0-6-0	Freight	14
0-6-0 (tank)	Switch	23
4-4-0	Fast passenger	36
2-4-2 (tank)	Passenger	7
2-6-0	Passenger	7
2-6-0	Freight	25
2-6-0 (tank)	Passenger	33
0-8-0	Freight	15
Total		171

On some of the lines with heavy grades I observed freight engines with five pairs of drivers, but without leading or trailing trucks. As yet very few articulated engines of the Mallet type have been used in Germany, although they are being introduced to a certain extent in Belgium, Hungary and the mountainous Balkan regions. The principal reasons why French locomotives with their great tractive effort are not used in Germany are that the topography is generally favorable to moderate grades, and also because of the limitation placed upon train length, this limit being 120 axles, with a very few districts where 150 axles can be employed. Inasmuch as the German freight cars have a rigid wheel base with only two pairs of wheels, two German cars are about equal in capacity to one American freight car with its two four-wheel trucks, and we may consider the German limitation as to train length as equivalent to what would be a limit of thirty cars with us. This does not take into account the much greater clearance of our cars and the consequently heavier load carried per axle.

The handling of the locomotives at a terminal has features of interest to Americans and offers some contrasts to our practice. There are usually two freight yards at a large terminal. Passenger trains are assembled in a portion of these yards. One freight yard is devoted to arriving trains, the other to departing trains, both being worked like a hump yard in America. A locomotive is supposed to enter upon the classification tracks itself only when coupling on to its train to depart. This, of course, lessens the shock given the cars as they come together on the classification tracks, as they are propelled only by the gravity of a light grade and meet end on against the large side spring buffers. There is consequently very much less damage to rolling stock on account of rough handling than is the case in America where in the last two or three years freight car repairs have taken the first place away from locomotive fuel as the principal item of railroad operating expense. As car by car is uncoupled from the string of cars, and allowed to drift down on the classification tracks, a head switchman calls out a number which another switchman marks in large chalk figures upon one of the buffers. These numbers can be distinguished easily at a distance of 200 feet. The switch tenders are provided with very narrow but quite confortable shelter houses placed conveniently between the tracks. I have described the operation of the freight yard to some extent because the handling of the yard, as well as of the roundhouse, comes under a man holding the title of "Ausfahrrangierbahnhof Stationsvorstand," which being interpreted means "General Foreman of the Out-going Yard and Engine Terminal."

The roundhouses themselves are quite similar to those in America, the radius, however, being smaller and the turntable pits usually being covered. The turntables are generally operated by hand. I did not see any roundhouses in Germany with the central portion covered over, as was the case in France. Practically no work in the way of repairs is done in the roundhouses, such work being confined to the "adjusting shop buildings," the roundhouses serving for inspection, cleaning, oiling, etc. In the roundhouses are also found lockers which are assigned to the enginemen and in which they keep their clothes, tools, and other belongings.

The engineer and fireman of a German locomotive, although their duties have been much lightened during the past ten years, still give great attention to the maintenance and preparation of the engine and also in looking after it at the end of a trip. The engineer is scheduled to be at his engine an hour before the time of departure of the train; the fireman two hours before. The fireman builds and prepares the fire and hostles the engine until it is taken charge of by the engineer. The engine having been thoroughly oiled and any necessary supplies provided by the engine crew, it goes direct from the roundhouse to its train, stopping only to take water. At the end of the trip the engine goes first to the coaling platform, where coal is loaded on by a gang of men especially employed for the purpose. After being coaled it goes to the ash track, and there the fireman cleans the fire. The engine is then brought into the roundhouse where the engineer not only makes out his work report, but attends to minor adjustments himself. It is not the practice to keep engines under steam for many hours in the roundhouse, this being done only where a very large modern locomotive is double and, occasionaly, treble crewed. Engines are assigned, not pooled, but full service is gotten out of the larger power by the practice of double crewing. The men must have a minimum of eight hours' rest after a run.

Premiums are given for savings in oil and small supplies, although the room for economies in this direction would seem to be less than exists in the United States because of the very thrifty nature of the German people. It was surprising to learn that the German authorities should take the trouble to keep the necessary records for the payment of these small premiums.

The fires are built with bundles of faggots and small bundles of kindling impregnated with pine pitch. Many of these faggots appear to have been gathered up where they had fallen in the great State Forests, this being a practical application of the principle of conservation, that nothing should be wasted—wood, otherwise useless, should be put to a good purpose. As a consequence of this kind of policy, Germany's annual forest growth is almost equal to her annual needs for timber.

The Germans are very much more economical in fuel than the Americans, as the following comparative figures on fuel

consumption per locomotive mile in different classes of service would indicate:

Class of service.	Pounds fuel burned per locomotive mile.	
	Prussian.	American.
Passenger	43.6	93
Freight	61.6	214
Switch	44.8	147

The above comparison is between a division of the Prussian State Railway and a division of a representative American road in a similar industrial locality.

The difficulty of mining coal in Germany makes it a much more expensive commodity than it is in the United States, and the Germans have not such rich deposits of good coal. The Prussian State Administration, for instance, has to pay about $2.75 per ton of 2,000 lbs., thus making economy of fuel in their railroad operations compared with cost of other items (such as labor, wages being about half those prevailing in the United States) a very important consideration. For this reason great care is used in the selection of the grades of fuel burned, in the utilization of the poorer grades for locomotive purposes, in the heat efficiency of the design of the locomotive, and in the care with which the locomotive is operated.

Germany was the birthplace, about 1895, of the Schmidt locomotive superheater, and from about 1901 on, after the preliminary experimental stages with this device, its application to old as well as new locomotives took on enormous strides, so that today, of the some 20,000 locomotives belonging to the Prussian State Railways, about 5,000 are equipped with superheaters.

From the poorest qualtities of coal, called "brown coal," a shaley stuff between lignite and peat, briquettes are made having a very high fuel value. These briquettes are used where it is desired to avoid smoke, such as in passenger terminals, and also when it is desired to give the engine additional evaporative efficiency—as on starting a train and in climbing a steep grade. About 25 per cent. of the fuel burned on Prussian locomotives is in briquette form, and the storage coal that is kept through the winter season and to guard against irregularities in mining and commercial demands, is largely in briquette form also, these briquettes being very conveniently piled as we would pile bricks.

Engineers and firemen are also carefully trained as to fuel and steam use, and with the assigned engines the men act as if they were footing the fuel bills themselves. This, taken in conjunction with the eagle-eyed watchfulness of the fuel performance of each train by the railway administrative officials, makes for an astounding degree of efficiency, and is in a large measure responsible for the comparatively low fuel consumption shown in the figures above quoted. In these figures there is, of course, no indication of the relative amount of work done by the locomotives, nor of their size. It may be presumed that the American locomotives would require about twice as much coal as the German locomotives. Even allowing so great a margin—which is high, as the German locomotives are the largest in Europe—the discrepancy between the consumption in the two cases is very marked; and in view of the millions of dollars expended annually by every American railroad system for fuel, would warrant a most careful study as to causes and results, combined with an equal thoroughness in applying such practices as would be of benefit to American operating conditions.

One of the most modern coaling stations that I saw in Germany, not yet entirely completed, handled the coal in the following manner. Upon either side of a double track was a concrete wall or parapet, the level of the platform at the top of this wall being several feet above the top of the locomotive tender. The edge of the platform was bordered by a pipe railing, broken at intervals by small automatic shoots. About twenty feet back from the edge of the parapet was a pile of coal which was shoveled by hand from cars of the gondola type, whose sides, however, swung out somewhat like the sides of ballast cars, thus reducing the amount of hand shoveling required. Several laborers shoveled the coal from this storage pile into little hopper trucks of about half a ton capacity, which were then pushed by hand along a narrow gage track to the automatic shoots through which the contents were dumped into the tender of the waiting engine by pressure upon a single lever. The whole procedure worked with neatness and despatch, and a close record was kept of the amount of coal supplied to each locomotive. At the older coaling stations at smaller places the platforms are quite low and the coal was shoveled into straw baskets holding about 100 to 200 lbs. each which were lifted up by hand and dumped into the tenders. Finally, in connection with the fuel, it was observed that the practice of storing large quantities of coal, and particularly briquettes, was quite general. The sanding of the locomotives was done in the roundhouse by a man who carried the sand around from engine to engine in a wheel barrow.

While the wages generally among the railroad employees in Germany are low compared with our standards, some of the ordinary laborers getting as little as about 70 cents a day, the comfort and well-being of the men and their families is well looked after, it being customary to provide what are called "living colonies" where modern houses are provided at a considerably lower cost than the men could find elsewhere. These "colonies" are located with convenient access to the workshops or terminal yards where the men are employed, and are for the benefit of the men in train service, as well as for those stationed at the terminal. A visit through one of them gave somewhat the same impression as a visit through a college dormitory, so neat, orderly and well kept were they.

Not only are the ordinary employees provided with dwellings at low cost, but this is also done for the officers in direct charge of the terminal yards. These have their dwelling rooms on the upper floors of the handsome buildings that house the officers on the ground floors, and the group of buildings composing these combined offices and dwellings with their surrounding flower and vegetable gardens are located a short distance from the yard and roundhouse. As an indication of the way in which the general foreman of such a terminal is provided for, it may be said that at a place despatching over 150 trains a day the man in this position receives a salary of 6,000 marks, or $1,500 annually, and in addition is provided with ample living quarters for which a rental of $100 a year is charged. One of these foremen, after showing me his quarters, assured me that he could not do as well in the suburbs of the city for $25 a month. This makes his salary equivalent to about $135 a month.

Not only is the employee of the German State Railroad well looked after during his life of activity and health, but he is taken care of during times of illness, accident and in his old age, the whole scheme being worked out in a scientific manner so that the man can devote his life with entire confidence to his chosen profession of railroading, secure in the knowledge that he cannot be discharged or demoted without proceedings similar to a court trial in the army or navy; secure also in a certain minimum increase in wages with the completion of each period of service.

Belgian Rolling Stock Output.—Belgium is very much more than the most thickly populated country in Europe, for it presents within its narrow confines a splendidly developed industrial world. Railway engineering is one of the most prosperous undertakings in Belgium. The rolling stock output is about 1,000 locomotives, 8,000 passenger cars and 25,000 freight cars. Some idea of the Belgian foreign trade may be gathered from the fact that the annual export of railway material is something like $40,000,000. One may travel anywhere on the three thousand miles of Belgian State Railways for about $2.50 for a period of five days—which gives a rare opportunity to travel at a very low cost, while the steamer services are also excellent.

STATUES ON WASHINGTON UNION STATION.

The Union passenger station at Washington, D. C., which was put in use five years ago, and which was described in the *Railroad Gazette* of November 1, 1907, has only just been finished; that is to say, the six colossal statues, which form an important feature of the facade, have only just been put in place. A view, looking from the south, made from a photograph by G. V. Buck, of Washington, and showing the general appearance of these statues, is given herewith. The main entrance to the station is through three lofty arches; and there are six massive stone columns, two of which appear in the illustration. There are two others at the left of the left or western arch, and two at the right of the right arch. Each of these columns is surmounted by a statue about 18 ft. high.

Those on the west side of the entrance represent Prometheus

SWEETENER OF HUT AND OF HALL
BRINGER OF LIFE OUT OF NAUGHT
FREEDOM O FAIREST OF ALL
THE DAUGHTERS OF TIME AND THOUGHT
MAN'S IMAGINATION HAS CONCEIVED ALL
NUMBERS AND LETTERS ALL TOOLS VESSELS
AND SHELTERS EVERY ART AND TRADE ALL
PHILOSOPHY AND POETRY AND ALL POLITIES
THE TRUTH SHALL MAKE YOU FREE

Main Entrance to the Union Station, Washington, D. C.—Statues by Louis St. Gaudens.

and Thales, typifying fire and electricity; those on the east side represent Ceres and Archimedes, typifying agriculture and mechanics, while the two central figures represent Freedom and Imagination. Those on the west side represent two forces, the connection of which with railroad operation is obvious; and agriculture, nowadays, has a relation to transportation hardly less prominent than mechanics.

No less interesting than the statues are the inscriptions which accompany them, the author of which was Charles W. Eliot, President Emeritus of Harvard University. These inscriptions, not very clearly shown in the illustration, are copied in full below, including also those over the carriage and the state entrances, at the extreme west and east ends of the station. The columns flanking the carriage entrance and the state entrance are surmounted by stone eagles about 8 ft. high.

Inscription on Attic of Central Pavilion, Western Panel.

Fire—Greatest of Discoveries,
Enabling Man to Live in Various Climates,
Use Many Foods, and Compel
the Forces of Nature to Do His Work.

Electricity—Carrier of Light and Power,
Devourer of Time and Space—Bearer
of Human Speech Over Land and Sea,
Greatest Servant of Man—Itself Unknown.

Thou Hast Put All Things Under His Feet.

Inscription on Attic of Central Pavilion, Central Panel.

Sweetener of Hut and Hall,
Bringer of Life Out of Naught,
Freedom, O Fairest of All
The Daughters of Time and Thought.

Man's Imagination Has Conceived All
Numbers and Letters—All Tools, Vessels
and Shelters—Every Art and Trade—All
Philosophy and Poetry, and All Polities.

The Truth Shall Make You Free.

Inscription on Attic of Central Pavilion, Eastern Panel.

The Farm—Best Home of the Family—Main
Source of National Wealth—Foundation of
Civilized Society—The Natural Providence.

The Old Mechanic Arts—Controlling New
Forces, Build New Highways for Goods
and Men—Override the Ocean—And Make
the Very Ether Carry Human Thought.

The Desert Shall Rejoice and Blossom
as the Rose.

Inscription on Attic of Carriage Porch, South Elevation.

He that Would Bring Home the
Wealth of the Indies Must Carry
the Wealth of the Indies with Him.
So It Is in Traveling, a Man
Must Carry Knowledge with Him
if He Would Bring Home Knowledge.

Inscription on Attic of State Entrance, South Elevation.

Let All the Ends Thou Aim'st at Be
Thy Country's—Thy God's—and Truth's.
Be Noble, and the Nobleness that
Lies in Other Men, Sleeping but
Never Dead, Will Rise in Majesty
to Meet Thine Own.

Inscription on Attic of State Entrance, East Elevation.

Welcome the Coming,
Speed the Parting Guest.

Virtue Alone Is Sweet Society
It Keeps the Key to All
Heroic Hearts and Opens You
A Welcome in Them All.

General News.

Shop employees of the National Railways of Mexico struck on December 26, because of the refusal of the management to grant an 8-hour day and an increase in wages.

The Boston & Maine has applied to the Massachusetts authorities for permission to build four main tracks through the city of Salem, on the present location, and also for such legislation as may be necessary to authorize the electrification of the road between Boston and Beverly, 19 miles.

The Baltimore & Ohio last week put in use the new double-track Sand Patch tunnel. This tunnel is through the Allegheny mountains between Sand Patch and Manila, 30 miles west of Cumberland. Its cost is approximately $1,250,000, and it has taken about two years to complete it.

Parcel post troubles at the Gary (Ind.) post office began today, when W. H. F. Parry, a brick dealer, sent two wagon-loads of paving brick to be mailed out the first thing on Wednesday morning. There were 1,000 bricks, each brick wrapped separately; and their total weight was 6,000 lbs. The bricks are being mailed as samples.—*Press Despatch, December 30.*

Bench warrants have been issued by the Criminal Superior Court at Bridgeport, Conn., for Henry J. Horn, vice-president; Benjamin R. Pollock, general manager, and Charles N. Woodward, general superintendent of the New York, New Haven & Hartford, charging them with manslaughter in causing the derailment at Westport, October 3. The warrants are based on the finding of Coroner Phelan.

By a bridge failure at Guyandotte, W. Va., on the Chesapeake & Ohio, January 1, seven men were killed and the lives of several others are believed to have been lost. A freight train crashed through a weakened bridge across Guyandotte river. A crew of thirty or more ironworkers were putting in a bridge for a second track, and the freight appears to have been running at very low speed. The cause of the accident is believed to be undermining of piling.

The Chicago, Burlington & Quincy began moving its general offices in Chicago on December 28, from the old headquarters at Adams and Franklin streets, to the company's new 16-story office building at Jackson Boulevard and Clinton street. This building was described in the *Railway Age Gazette* of December 8, 1911, page 1174. The moving will require approximately two weeks. The new structure contains 225,000 sq. ft. of floor space as compared with 75,000 sq. ft. in the old building. It has a frontage of 150 ft. on Jackson boulevard and 175 ft. on Clinton street.

The Canadian Pacific has petitioned the Parliament of Canada to amend the Act of 1906 incorporating the Toronto Terminals Railway Company. This is the Act providing for the construction of the Union Station at Toronto. The Toronto Terminals Railway Company was empowered to build a union passenger station and hotel. The Grand Trunk was authorized to transfer the union station property to the Canadian Pacific. The company was capitalized at two millions, the Canadian Pacific Railway and Grand Trunk Railway having each the right to hold half the stock. The station was to be built by February 23, 1908, or such later date as the Railway Commission might set.

A settlement has been reached between the striking Western machinists of the Grand Trunk Pacific and President E. J. Chamberlain, which will clear the way for the opening of the Transcona shops. The company agrees to reinstate all strikers who apply within 30 days. For the present the existing rate of pay and rules will prevail, 45 cents an hour for Rivers and east of Rivers, and 47½ cents west of Rivers. The company agrees that next spring, if the men so desire, the Western management will meet a committee of the men to decide upon a new agreement and a new schedule, and failing to arrive at terms the differences will be submitted to a conciliation board appointed under the Industrial Disputes Act.

At Indianapolis, December 31, sixteen officers and directors of the Cincinnati, Hamilton & Dayton and two trainmen were indicted, on charges of involuntary manslaughter, by the Marion

county grand jury in connection with the collision near that city on November 13, when 16 persons were killed, because of a misplaced switch. Those indicted were: Daniel Willard, president; George F. Randolph, vice-president, and George M. Schriver, second vice-president; W. C. Loree, general manager; H. B. Voorhees, general superintendent; R. B. White, division superintendent; O. G. Murray, George W. Perkins, L. F. Loree, H. P. Davison, Frederick W. Stevens, Joseph Wood, E. R. Bacon, F. D. Underwood, Harry Bronner and Norman B. Ream, directors; Carl Gross, brakeman, and Willis York, engineman.

The postmaster general has written to the House Committee on Postoffices and Postroads recommending legislation to readjust the method of computing payments to railroads for transporting the mails. "On account of the institution of the parcel post system," says Mr. Hitchcock, "the weight of mail to be transported probably will be increased considerably and, under existing law, no additional compensation may be paid until there has been a weighing of the mails and a readjustment of the basis of pay." And he repeats the proposition, which he suggested a year ago, for substituting space for weight as the chief factor in determining compensation. Under this plan it would be possible to ascertain without delay what, if any, additional compensation should be given the railroads on account of the parcel post.

Record Rail Orders in 1912.

According to the *Wall Street Journal* rail orders in 1912 amounted to approximately 5,000,000 tons, a large part of which will be delivered in 1913. This paper goes on to say that this is the largest tonnage of this product ever ordered in one year.

Death and Injury Benefits for Government Employees.

The solicitor for the Department of Commerce and Labor, in a report summarizing his decisions under the law of May 30, 1908, providing for compensation to certain government employees in cases of injuries, fatal or non-fatal, received in the course of their employment, presents a statement showing that in about three years more than $800,000 has been thus paid out. The report says:

"The act has been in operation since August 1, 1908. Between that date and December 1, 1911, compensation was paid in 5,564 cases of injury, in 165 of which the injury resulted in death. On account of these fatal injuries $112,879 has been paid to surviving dependents. On account of the non-fatal injuries $704,815 has been paid to the injured persons themselves. (The figures given do not refer to claims arising on the Isthmian Canal since March 3, 1911, when the Isthmian Canal Commission was authorized to handle such claims directly.) These payments have been made, not out of any special appropriation, but from the ordinary current appropriations for salaries. The salary has simply been paid as if the injured man continued at his work, until his incapacity ceased or until the year had run. Owing to the limited scope of the act there have been naturally more accidents reported than claims filed, and there have been also a number of claims filed which could not be allowed either because they were not within the act or were not properly established. In the first year, the number of injuries reported was 4,862, and the number of fatalities 233, while the number of claims submitted was but 1,805, of which 1,689 were allowed. During the second year 6,984 accidents were reported and 226 fatalities; 2,624 claims were submitted and 2,499 allowed. Legislation to extend the benefits of the act has been recommended by the Secretary of Commerce and Labor, and measures designed to enlarge the scope of the act are now pending in Congress."

October Traffic Exceeds All Records.

The receipts and the expenses of the railways of the United States for the month of October, as compiled by the Bureau of Railway Economics, are greater than for any month in their history. Net operating revenue averaged $15.71 per mile of line per day, as compared with $13.74 for October, 1911. The summary covers 220,636 miles of line, or about 90 per cent. of all the steam railway mileage of the United States. The aggregate net operating revenue for this mileage was $107,440,518. The increases were due in greatest proportion to the freight traffic, which is always greater in October than in any other month of the year.

New Subways in Boston.

The Boston Transit Commission has opened bids for the construction of section 4 of the Boylston street subway, which includes the station in Copley square. The lowest bidder was the Hugh Nawn Construction Company, $743,700; four other bids ran from $750,050 to $927,945. About half of the Boylston street subway has been finished. The commission will soon advertise for bids for work on the Dorchester tunnel, which will pass beneath Fort Point channel.

Transportation Simplified.

The San Pedro, Los Angeles & Salt Lake announces that a small open gasoline motor car, with accommodations for about eight passengers and a small quantity of light baggage, has been put in service on the St. Thomas Branch from Moapa(Nevada) to St. Thomas, about 20 miles. The car will leave St. Thomas at 8:30 a. m., making connections with train No. 2, and returning will leave Moapa at 3:25 p. m., or on arrival of main line train No. 1.

The Pullman Company on the New Haven Road.

The New York, New Haven & Hartford announces the transfer of its parlor and sleeping car service to the Pullman company under a contract dated January 1, 1913, and running twenty years. The Pullman company will take over the parlor and sleeping cars owned by the New Haven, paying, it is understood, about $3,500,000, and will gradually introduce steel cars, the first replacement being on the limited trains. All of the employees of the New Haven service will be retained, their pay and relative positions being unchanged. They will be under the supervision of A. J. Grant, Pullman superintendent, Grand Central Terminal, New York City.

The parlor and sleeping car conductors of the New York, New Haven & Hartford have adopted resolutions reading in part: "Whereas in the vicissitudes of railroad life we are about to be transferred to the employment of the Pullman Company, and whereas the majority of our number having been employed by the New Haven road upward of 15 years, and whereas there has always existed a most cordial and just treatment of us by our superior, be it Resolved, That we extend to President Charles S. Mellen and the board of directors our thanks for the just and kindly consideration and treatment of us during our long years of service, and that we extend to our beloved superintendent, A. G. Webb, our sincere thanks for his just, kindly and courteous treatment. . . ."

A Correction.

In the item entitled Exhibition Run of Drake Gas-Electric Car, which appeared in the *Railway Age Gazette* of December 20, page 1221, the statement to the effect that the average consumption of gasoline was 2½ gallons per mile should have read 2½ miles per gallon.

"Safety First" in Utah.

The safety committee of the Utah division of the Oregon Short Line, as a result of a contest, announces that prizes of $10 and less have been awarded to Mrs. Joseph Severn, Mrs. Martha D. White, Mrs. Mary Anderson, Mrs. Mary Karren and Mrs. Ella Kelson for papers on "safety." Mrs. Severn is the wife of Joseph Severn, division accountant in Assistant Superintendent Malone's office, and her essay is as follows:

What "safety first" means to me: Home, comfort, magazines and books, pretty things, a little art, a little travel, children reared in a "homey" home with the inalienable right to educational advantages; fatherly as well as motherly discipline and comradeship; an occasional romp with "Dad"; the chummy, inadvertently given good counsel of father—these things go to make up a home, the maintenance of which rests in equal exchange between railroad and employee, of money and human energy.

A desolated home—the father's life sacrificed in service; no amount of poetry or eulogy can soothe the heart-ache or picture the shock; no life insurance policy or railroad settlement can

put complacency in the place of distress. To a woman's heart such things are a mere insult when proffered as a substitute for the big, fatherly personality which has been sacrificed.

A maimed home—a limb lost, or an eye; just so much earning capacity, to speak practically; just so much of one's right to complete life snatched away. To be crippled, what fortitude it demands! Here, again, money damages are an all too poor compensation.

To live one's complete life—this is what safety means to me; the maintenance of a home in exchange for a man's best energy. This is just and right and good; and safety first, aye, a man assured that the railroad regards him as a man, not a machine, and really cares for his safety and his home, what good service will he not heartily render!

Efficiency Society.

The annual meeting of the Efficiency Society will be held January 27-28 at the Engineering Societies building, New York. The program for January 27 will include a Symposium on Organization, a Discussion on the Necessity of Charts of Organization; a Symposium on Management; a Discussion on Democracy in Industry and Securing the Consent of the Governed; and a Symposium on Efficiency in Government Organization, National, State and Municipal. The program for January 28 will include a Symposium on Industrial Relations, a Discussion on the Relations between Employer, Employee and the Community; a Symposium on Industrial Hygiene and Safeguards against Occupational Diseases and Accidents; and a Symposium on Safety, including Safety in Land Transportation. This session will be illustrated by moving pictures and lantern slides demonstrating the efficiency obtained by conserving the human elements in industry. The officers of this association are as follows: President, James G. Cannon; first vice-president, Henry R. Towne; second vice-president, Melville W. Mix; treasurer, Theodore Hetzler; assistant treasurer, Francis W. Hoadley, and secretary H. F. J. Porter.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Annual meeting, June 17-20, Buffalo, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRICAL RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 21, New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Convention, March 18-20, 1913, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 11-13, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, January 21-23, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago. Next meeting, May, 1913, Baltimore, Md.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June, 1913, Atlantic City, N. J.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, June 18, Bluff Point, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual meeting, May, 1913, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, Chicago & North Western, Escanaba, Mich. Next convention, July 22-25, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 16-18, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.

NATIONAL RAILWAY APPLIANCES' ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City, Southern, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Meetings, March 17, Chicago; June 10-11, New York; convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Annual convention, May 19-21, Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La. Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala: Next meeting, April 17, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago. Annual meeting, June 17, Los Angeles, Cal.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

In Mexico, as well as in other parts of the world, there is a shortage of freight cars. The activities of the rebels have decreased so that mines and manufacturing plants are resuming work, but they are much hampered by lack of transportation facilities. The government is using the lion's share of the cars to move troops and military supplies.

The two passenger trains between Weehawken, N. J., and Chicago, over the New York, Ontario & Western, and the Wabash, which hitherto have run over the R. W. & O. division of the New York Central, are now running over the N. Y. C. main line, connection with the Wabash being made at Buffalo and with the New York, Ontario & Western at Earlville.

All previous records for the production of coal in the United States were beaten in 1912, if both hard and soft coal be taken into account. But the production of hard coal alone fell below that of many previous years. Assuming that the December shipments were the same as in December, 1911, the total shipments of anthracite for the year 1912 amounted to 63,781,503 tons. This is a smaller tonnage than for any year in the last six except 1909, when the shipments were 61,969,885 tons. Assuming the quantity sold to local trade and employees at 3 per cent., then the total marketable output of anthracite in 1912 was 65,694,948 tons, as compared with 72,000,000 tons in 1911. The suspension of work for about seven weeks last spring was the cause of the falling off in production.

The Union Pacific has notified its competitors between the Missouri river and Denver and also the Denver & Rio Grande and Colorado Midland that it will no longer be a party to certain tariffs showing through rates for passengers and freight over these lines. The effect of the notice is to close the Denver gateway on January 1 to the Atchison, Burlington, Missouri Pacific and Rock Island with respect to traffic from east of Missouri River for certain destinations west of Denver. It applies only to traffic east of the river and bound for the Northwest; that which will be handled by the Oregon Short Line and Oregon Railroad & Navigation. It will not apply to traffic for California points. Neither will it apply to traffic originating at points between the Missouri River and Denver. The purpose is to secure for the Union Pacific the through haul between the Missouri River and Denver on traffic originating east of the river, but which has been delivered to the Union Pacific at Denver by lines competing with it between the Missouri River and that point.

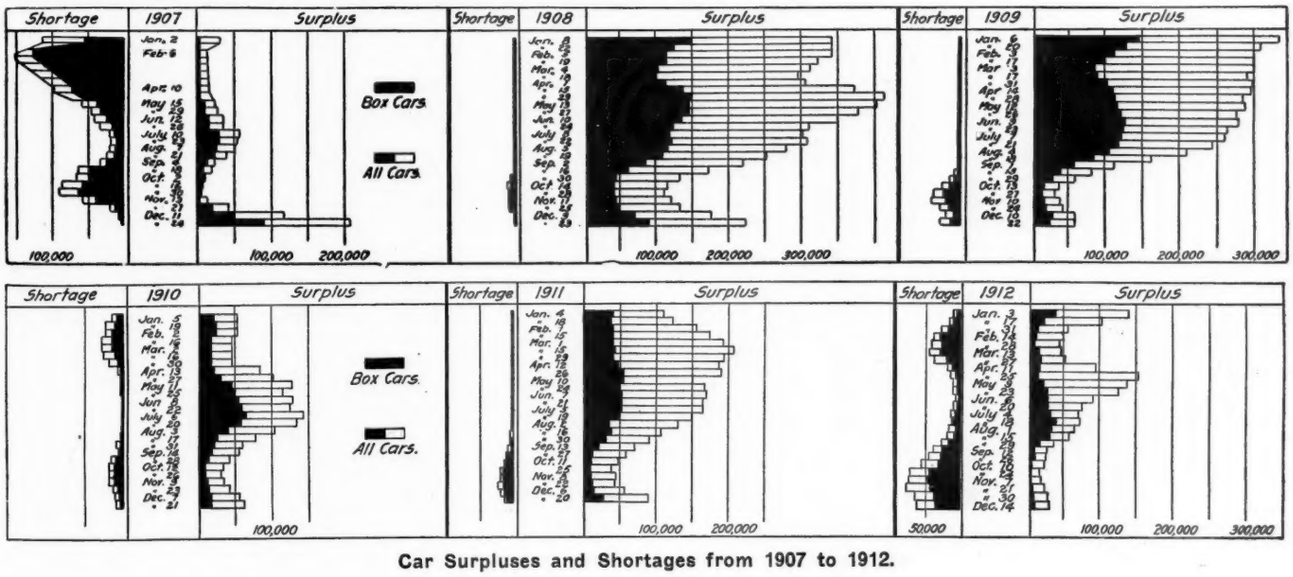
Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on Relations Between Railroads of the American Railway Association, in presenting fiscal bulletin No. 133A, giving a summary of car surpluses and shortages by groups, from September 13, 1911, to December 14, 1912, says: The total surplus on December 14, 1912, was 26,614 cars; on November 30, 1912, 26,135 cars; and on December 20, 1911, 88,646 cars. Compared with the preceding period, there is an increase in the total surplus of 479 cars, as follows: 231 box, 62 flat, 1,183 miscellaneous and a decrease of 997 in coal car surplus. The increase in box car surplus is in groups 1 (New England Lines), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), 9 (Texas, Louisiana and New Mexico), and 10 (Washington, Oregon, Idaho, California, Nevada and Arizona). The increase in flat car surplus is in groups 1 (as above), 3 (Ohio, Indiana, Michigan and Western Pennsylvania), 4 (the Virginias and Carolinas), 9 (as above), and 11 (Canadian Lines). The increase in miscellaneous car surplus is general throughout the country, except in groups 2 (New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania), 4 (as above), and 5 (Kentucky, Tennessee, Mississippi, Alabama,

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—December 14, 1912	7	187	391	56	95	729	482	131	498	431	1,542
" 2.— " 14, 1912	27	351	23	691	120	1,185	1,232	11	3,491	558	5,292
" 3.— " 14, 1912	31	54	212	177	696	1,139	7,654	10	3,515	1,117	12,296
" 4.— " 14, 1912	10	186	40	725	447	1,398	4,091	1,156	4,547	653	10,447
" 5.— " 14, 1912	23	7	0	9	66	82	4,577	1,490	1,418	107	7,592
" 6.— " 14, 1912	27	1,087	291	1,528	2,378	5,284	6,269	490	1,469	880	9,108
" 7.— " 14, 1912	4	0	57	61	472	590	577	46	0	0	623
" 8.— " 14, 1912	16	171	110	994	1,055	2,330	1,894	301	196	284	2,675
" 9.— " 14, 1912	13	1,635	205	204	849	2,893	726	9	9	6	750
" 10.— " 14, 1912	22	1,939	1,283	2,157	4,774	10,153	2,021	63	260	821	3,165
" 11.— " 14, 1912	6	96	369	0	366	831	7,008	90	0	418	7,516
Total	186	5,713	2,981	6,602	11,318	26,614	36,531	3,797	15,403	5,275	61,006

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages from 1907 to 1912.

Georgia and Florida). The decrease in coal car surplus is in groups 2, 3, 5 (as above), 6 (Iowa, Illinois, Wisconsin and Minnesota), 7 (Montana, Wyoming, Nebraska and the Dakotas), 8 and 9 (as above).

The total shortage on December 14, 1912, was 61,006 cars; on November 30, 1912, 62,536 cars; and on December 20, 1911, 11,832 cars. Compared with the preceding period; there is a decrease in the total shortage of 1,530 cars, as follows: a decrease of 2,192 box, 585 flat, 1,378 miscellaneous and an increase of 2,625 coal cars. The decrease in box car shortage is in all groups, except 3, 4, 6 and 7 (as above). The decrease in flat car shortage is throughout the country except in groups 4 and 7 (as above). The decrease in miscellaneous car shortage is in groups 1, 3, 5, 6, 8, 9, 10 and 11 (as above). The increase in coal car shortage is in groups 2, 3, 4 and 6 (as above).

Compared with the same date of 1911; there is a decrease in the total surplus of 62,032 cars, of which 17,772 is in box, 3,028 in flat, 28,807 in coal and 12,425 in miscellaneous. There is an increase in the total shortage of 49,174 cars, of which 26,866 is in box, 3,535 in flat, 13,934 in coal and 4,839 in miscellaneous cars.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report; and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1912.

Traffic Club of Chicago Favors Commissioner Clark.

The board of directors and governors of the Traffic Club of Chicago at a special meeting recently adopted the following resolutions addressed to President Taft urging the reappointment of Commissioner Clark:

Whereas, The Traffic Club of Chicago, is a voluntary association, the membership composed of representatives of the shipping public and representatives of carriers, about equally divided, to the number of nearly one thousand, and

Whereas, The Traffic Club of Chicago and its members, are vitally interested in maintaining the high standard of efficiency of the Interstate Commerce Commission, are familiar with the work of that commission, and understanding the necessity of practical and experienced men to handle the broad national matters that are involved, and having knowledge of the experience, efficiency and high order of ability of Edgar E. Clark; therefore be it

Resolved, That we do hereby earnestly request reappointment and confirmation. . . .

The President has reappointed Mr. Clark, but the confirmation, together with that of many other Republicans, was held up by a Democratic Senate.

The annual meeting and dinner of the Traffic Club of Chicago will be held on January 28. The programme has not yet been announced.

INTERSTATE COMMERCE COMMISSION.

Rates on Petroleum and Its Products Reduced.

National Refining Company v. Missouri, Kansas & Texas et al. Opinion by the commission:

The rate of 27 cents per 100 lbs. for the transportation of petroleum and its products in carloads from Coffeyville, Kans., to Joliet, Ill., was found to be unreasonable to the extent that it exceeds 22 cents per 100 lbs., which rate is prescribed for the future. (25 I. C. C., 374.)

Detroit, Mich., Discriminated Against.

Michigan Copper & Brass Company et al. v. Duluth, South Shore & Atlantic et al. Opinion by Commissioner Meyer:

The defendants maintain an all-rail rate on refined copper from points in the upper peninsula of Michigan to New York that is 3 cents per 100 lbs. higher than the all-rail rate from the same points to Detroit, Mich. The complainants allege that this differential is unduly low and that the all-rail rate of 32½ cents to Detroit is unreasonable. The commission found that the rate to Detroit is unjustly discriminatory as compared with the rate to New York; that the defendants subject the complainants and the locality of Detroit to undue and unreasonable prejudice and disadvantage; and that for the future the differential should not be less than 10 cents; also that the rate to Detroit is not, under the present conditions, unreasonable. (25 I. C. C., 357.)

Elevator Case Decided.

H. Gund & Company v. Chicago, Burlington & Quincy. Opinion by Commissioner Lane:

At the original hearing, 18 I. C. C., 364, the complainant asked reparation upon all grain passing through its country elevators at interior points in the state of Nebraska, which grain was shipped through Missouri river points to eastern destinations, upon the ground that an elevation allowance was made by defendant to complainant's competitor for elevation-in-transit at Nebraska City; but action by the commission was deferred pending decisions of the United States supreme court in the *Elevation cases.* Since then such decisions have been rendered; but, following them, the commission cannot hold that the discrimination complained of was undue or unreasonable, because under said decisions a railroad may for competitive reasons grant an elevator allowance, although no transportation service is rendered by the shipper owning the elevator. (25 I. C. C., 326.)

Complainant Discriminated Against.

Edward G. Murray Lighterage & Transportation Company v. Delaware & Hudson. Opinion by Commissioner Harlan:

The complainant seeks an order requiring the defendant to grant it through routes and joint through rates on interstate traffic between points in the harbor of New York City and points on the rails of the defendant in the states of New York and Vermont. The defendant contends that the complainant is not a common carrier. The commission found that the complainant was as fully equipped for the handling of northbound traffic as its competitors. The commission ordered the defendant not to withhold in future the through routes and joint through rates on northbound interstate traffic consisting of bulk shipments of sulphur, resin, sand and similar articles from points in the harbor of New York City to points on the lines of the defendant in the states of New York and Vermont so long as the defendant maintains through routes and joint rates on similar traffic from and to said points with the competitors of the complainant similarly situated. (25 I. C. C., 388.)

Furniture Rates Increased.

In re investigation and suspension of advances in rates by carriers for the transportation of furniture from Napanee, Ind., to Chicago and other destinations. Opinion by Commissioner Meyer:

The commission found that the proposed advances in rates on furniture in carloads and less than carloads from Napanee, Ind., to Chicago, Ill., and Chicago rate points and also to points in Minnesota and Wisconsin on shipments via Chicago and Chicago junction points were not unjust or unreasonable. The order of suspension was vacated. The increases range from 2½ cents to 9½ cents per 100 lbs. on carloads, and from 8 to 10 cents per 100 lbs. on less than carloads. (25 I. C. C., 331.)

In re investigation and suspension of advances in rates by carriers for the transportation of furniture in carloads between points in Arkansas, Colorado, Florida, Kansas, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Washington, D. C., and other interstate points. Opinion by Chairman Prouty:

The advance in the proposed rates from St. Louis, Mo., to Texas common points is 6 cents per 100 lbs., from 79 cents to 85 cents, and there are corresponding increases to other Texas stations. The commission found that the proposed rates which had been suspended were not unreasonable. The order of suspension was vacated. (25 I. C. C., 299.)

California Demurrage Rate Increased.

In re Investigation and Suspension of Advances in Demurrage Charges on Interstate Traffic by Carriers Operating in the State of California. Opinion by Commissioner Clark:

Proposed increases in demurrage charges in the State of California applicable upon interstate shipments had been suspended by the commission. The commission found that upon this record the carriers have abundantly sustained the burden of proof to show that the increased charges are reasonable; and, that under

the circumstances here shown it is not unjustly discriminatory against California or against shippers or receivers in California to maintain higher demurrage charges at points in that state than are contemporaneously maintained in other states served by respondents. The order of suspension was vacated.

The report summarizes the history of the high demurrage rate in California. [The principal points of this history are given in an editorial on another page in this paper.] The railroad companies called numerous shippers and receivers of freight to testify in their favor, these witnesses recounting their experiences and giving facts and figures to sustain their testimony. The carriers also laid emphasis on the fact that the freight movement from the east to California is heavy from December to June, but light in the other half each year, while the eastbound movement is heavy from June to December and light in the other half. It was shown that the opposition to the six-dollar demurrage rate, when it went into effect, subsided after the result of the increase became apparent. The Pacific Car Demurrage Bureau presented statistical records showing that if the higher rate could have been charged on interstate as well as intrastate shipments the supply of freight cars would have been increased 3,000 cars a month. Elaborate statements were also presented showing how consignees and shippers, doing heavy business, and in large numbers had paid smaller amounts, in the aggregate, for demurrage after the introduction of the higher rate. As between shippers and consignees it appears that only 5 per cent. of the total demurrage collections come from consignors. The commission considered the demand that additional free time be given for unloading because carloads are so much larger now than in former years; but to this claim it is replied that a given quantity of freight can be unloaded from one car as quickly and as cheaply as it could be unloaded from two cars.

Commissioner Lane, concurring in the decision, says that his controlling reason is that the high rate is unopposed by the shippers. The phenomenally excellent condition that obtains in California is due, in his opinion, to the presence of an effective, powerful and authoritative demurrage bureau. Where railway officers are lax and the supply of cars is inadequate a higher rate would not be the proper remedy. It would be only a penalty imposed on the public because of the railroads' delinquency. The present opinion is to be taken as a promise to those roads who believe in doing their duty that the commission will co-operate with them; and it is not to be understood as the endorsement of any particular rate of demurrage or as the establishment of any permanent principle.

Chairman Prouty, in a dissenting opinion, agrees that there is undue detention of cars employed in interstate traffic, and that something must be done; but an increase of the rate is not the best thing to do. The inefficiency of car service in this country is due more to the railroads than to the shippers. While it is possible that the Pacific coast states may be so isolated from the rest of the country that a different rule can be applied there, the problem, he thinks, will be difficult. It is most unfortunate to break into the uniform demurrage code even upon the extreme edge.

The tariffs increasing the demurrage rates in California were suspended last February, and on June 3 a further suspension was ordered. The suspending orders are now vacated, to take effect January 6. (25 I. C. C., 314.)

Rates on Grain and Flaxseed.

Superior Commercial Club, of Superior, Wis., v. Great Northern et al. Chamber of Commerce of the City of Milwaukee v. Chicago, Milwaukee & St. Paul et al. Duluth Board of Trade v. Great Northern et al. Opinion by Commissioner Clark:

The ruling in the original report, 24 I. C. C., 96, was rescinded and the commission ordered the defendants in future to maintain rates on grain and flaxseed from points on their lines in Minnesota, South Dakota and Iowa, to Superior, Wis., in no case exceeding for equal distances their rates from the same points of origin to Milwaukee, Wis. The defendants are also ordered in future to maintain rates on grain and flaxseed from points on their lines in Minnesota, South Dakota and Iowa to Superior, Wis., via Minneapolis, in no case exceeding by more than 4 cents per 100 lbs. their rates from the same points of origin to Minneapolis, Minn. They are also ordered in future to maintain rates on grain and flaxseed from points on their lines south and west of Willmar, Minn., to and including Sioux City, Ia., and Yankton, and Huron, S. D., to Superior, Wis., in no case exceeding by more than 3 cents per 100 lbs. their present rates from the same points of origin to Minneapolis, Minn. Future rates on grain and flaxseed to Milwaukee, Wis., from points on the lines of the defendants in Iowa, Minnesota and South Dakota on and south of the Winona & St. Peter lines of the Chicago & North Western from Sanborn, Minn., to Pierre, S. D., and on the east of the line of the Chicago & North Western from Iroquois, S. D., to Yankton, S. D., shall in no case exceed for equal distances the rates from the same points of origin to Duluth or Superior. Rates on grain and flaxseed from points on the lines of the defendants in Minnesota, South Dakota, and Iowa, to Duluth, Minn., shall in the future not exceed for equal distances the rates from the same points of origin to Milwaukee, Wis. Future rates on grain and flaxseed from points on the lines of the defendants in Minnesota, South Dakota and Iowa to Duluth, Minn., via Minneapolis, shall in no case exceed by more than 4 cents per 100 lbs. their present rates from the same points of origin to Minneapolis, Minn. Rates on grain and flaxseed to points on the lines of the defendants east and west of Willmar, Minn., to and including Sioux City, Ia., and Yankton and Huron, S. D., to Duluth, Minn., shall in no case exceed by more than 3 cents per 100 lbs. the present rates from the same points of origin to Minneapolis, Minn. (25 I. C. C., 342.)

Rose Hill, Ill., Discriminated Against.

Thomas W. Gilmore & Company et al. v. Chicago & North Western et al. Opinion by Commissioner Meyer:

On carload shipments of bituminous coal from Chicago to the complainants at Rose Hill, Ill., the freight charge is 20 cents per net ton in excess of the charge for similar transportation to Ravenswood, Ill., a point in the Chicago switching district for the Chicago & North Western. On anthracite coal the charge to Rose Hill is 10 cents per ton greater than to Ravenswood. The commission found that this rate situation subjects the complainants to unjust discrimination and Rose Hill to undue and unreasonable disadvantage, and ordered that for the future the defendants shall not require the payment for the interstate transportation of coal in carloads to Rose Hill of a charge in excess of 5 cents per net ton over the charge for similar transportation to Ravenswood. (25 I. C. C., 403.)

Elaborate Report on Freight Classification.

In re suspension of Western Classification No. 51, I. C. C. No. 9. Opinion by Commissioner Meyer:

Western classification No. 51, I. C. C. No. 9, was filed December 28, 1911, to become effective February 15, 1912, and was suspended by the commission, pending this investigation, until December 14, 1912. Carriers voluntarily extended this suspension until February 14, 1913.

After discussing some of the larger and more fundamental general questions involved in this proceeding, consideration is given the individual rules in controversy, and this is followed by a discussion of the individual items in No. 51, to which objections have been raised. In connection with the discussion of both rules and items the application of the general principles involved is given additional consideration. Attention can be directed, in these headnotes, only in a general way, to a few of the most important considerations.

Classification is a public function. Public business cannot be conducted in a private way. Hearings of classification committees should be made public, after due notice to interested parties, including state commissions and the Interstate Commerce Commission. A record of facts and arguments should be made. As rapidly as items, or groups of items, have been disposed of by the classification committee they should be published in accordance with law. In the case of a protest to this commission, the record made up before the committee should be promptly submitted to the commission. On the basis of this record, supplemented when necessary by additional inquiries, the commission will be able to decide whether or not to suspend a proposed change in classification.

A compilation of classification units, expressing the relation to one another of weight, space and value, should be made, as far as practicable, for every item in the classification, and given due consideration.

The work of classification should be confined to classification

as such, entirely separate from the question of rates or revenues of carriers. Classification and rates and revenues should be treated separately. Having completed a new classification along the lines suggested, each carrier can readjust its rates on the basis of that classification in such manner as to preserve its existing revenues. The sufficiency or insufficiency of certain revenues and the level of particular rates or schedules are separate questions. A classification is a universal tariff from which the schedules of individual carriers should not depart, except in cases demanded by special conditions. Commodity tariffs in restricted number may always remain a necessity.

The classification movement since 1887, with a brief reference to conditions prior to that date, is described and mention made of the uniform classification of 1891.

The commission has repeatedly emphasized the necessity of greater uniformity in classification. Numerous quotations, bearing upon this subject, from decisions and annual reports of the commission are given. Reference is made to the past utterances of the commission with regard to the elements of classification, an enumeration of which is made.

Generally speaking, carload ratings should be established whenever carload quantities are offered for shipment and the public interest requires it. The relative merits of a system of any-quantity ratings as compared with a system of carload and less-than-carload ratings left for future consideration.

Liberal provisions should be made for mixtures. Artificial restrictions upon mixtures are restrictions upon the freedom of trade and commerce, with a tendency to militate against the small man. Mixtures result in a better utilization of car space; they lessen the demands upon terminal properties, they decrease the expense of operation and facilitate the movement of freight. A brief statement is made of the arguments for and against the incorporation in western classification of rule 10 of official classification.

An excessive difference between the carload and less-than-carload rates on the same commodity results in an undue preference to the carload shipper. Considerable diversity in the spread between carload and less-than-carload ratings is revealed. The relations between carload and less-than-carload ratings should be established in accordance with some consistent principle throughout the classification and the rate schedules which may be constructed upon it. In establishing a proper relation, consideration should be given to the relative cost of handling, the demands upon terminal properties and the utilization of equipment.

Generally speaking, freight cars should be made to fit the business. Within reasonable limits business may be required to adapt itself to the car.

Carriers should take into consideration both the physical minimum and the commercial minimum in deciding upon a classification minimum to govern carload shipments throughout the country and provide themselves with cars of corresponding sizes. What these shall be must be determined in the light of all the facts applicable to each individual case. The physical minimum is that minimum which represents the weight or bulk quantities which can be loaded into a car from the point of view of space or the theoretical number of packages capable of being loaded into a car, determined by dividing the cubical contents of the car by the cubical contents of one of the packages, multiplied by the weight of the package, possibly with some consideration of the dimensions of the package. The commercial minimum is that minimum which represents the unit of purchase and sale of the commodity in question as established by custom and the conditions existing in that trade and in the territory in which it governs at the time the minimum was established. The physical minimum would consider only physical loading capacity, while the commercial minimum would consider in addition trade requirements, conditions of manufacture, distribution and consumption.

From a classification standpoint, the security of a package may with propriety be considered in fixing the rating. A package which is less desirable from a transportation standpoint may be given a higher rating than one which is more desirable. The approval of this rule, however, does not sanction disproportionate and arbitrary increases in the rating of an article when offered in a less desirable package. There should be some relation between the increased rating and the increase in the risk, difficulty of handling, and other proper considerations.

In the present proceeding the discussion bearing upon a graduate scale has centered about rule 6-B. The principle of this rule is correct. It promotes economical use of car space and has a tendency to check the careless shipper. The restriction of the present rule to light and bulky articles is of doubtful propriety. On the other hand, a universal graduate scale probably cannot be devised. The loading possibilities of different commodities vary so widely in their relation to differing car dimensions that it may be necessary to adopt different scales for different classes of commodities.

The rule in *Southern Cotton Oil Company v. S. Ry. Co.*, 19 I. C. C., 79, approved. It is the duty of the initial carrier not only to advise the shipper of the lower rates applying in case of release of valuation, but when informed of the shipper's desire to avail himself of such lower rates to obtain the shipper's signature in accordance with the tariffs.

"Follow-lot" shipments should be marked by the shipper whenever they constitute an overflow resulting from the failure of the shipper to designate the dimensions of cars required. Where the shipment could be loaded in a car of the size ordered by the shipper and two cars are furnished by the carrier, the marking, where necessary, should be done by the carrier.

It is the duty of the delivering carrier to collect the lawful rates on shipments and to correct any errors that may have been made by the agents of the initial carrier in billing or in the collection of prepaid charges. This includes misbilling due to wrong description of the container. A provision should be inserted that, if the classification of a shipment is properly raised at the point of destination, by reason of the character of the container, the initial carrier shall be liable for the difference, unless misrepresentation was made.

Every effort of the carriers to compel accuracy and honesty in descriptions of freight deserves support. Inadvertent and unknowing misdescriptions are unfortunate in their possible discriminatory effect; conscious misrepresentations and misdescriptions are criminal and should be rigorously suppressed.

It is the right and duty of carriers to protect other freight from commodities which are likely to damage it. Certain perishable freight may at times, for sufficient reason, be refused under proper tariff provision or the classification.

If all the pieces constituting a completed article are offered as one shipment, under one bill of lading, the freight charge should be calculated upon a rating for the completed article. This does not prevent a shipper from billing separately each constituent part at its respective rating.

Carload quantities should not be received in freight houses. Storage space should be reserved for less-than-carload shipments. But when, for sufficient reason, a carrier has actually stored and handled carload quantities as it stores and handles less-than-carload quantities, it is entitled to fair compensation for the additional service performed.

Brunswick-Balke-Collender Company v. A., T. & S. F. Railway Company, 23 I. C. C., 395, affirmed, subject to the further investigation ordered in that case. (25 I. C. C.)

By requiring a substantial minimum to be loaded of each commodity in the mixture it would become impossible to defeat the minimum weight requirements of the others by including in the shipment a nominal quantity of one. Such provision should be inserted in rule 21-B.

It would hardly be in the public interest to require carriers to load or unload large, heavy, bulky less-than-carload shipments at any one of the thousands of stations in this country where they do not, and can not, maintain crews capable of handling consignments of this character. Carriers should advise shippers at the time shipments are received what is expected of them. This rule, like all others, must have a reasonable interpretation. Section crews should assist shippers wherever possible and practicable.

"Shippers' load and count." In connection with this subject a discussion is given of carriers' liability under ordinary bills of lading and those containing similar qualifying clauses. As this subject is covered by pending legislation of Congress fixing the liability of the carriers, the commission refrains from making recommendations.

The allowance of 500 pounds for "dunnage" should be continued.

The classification should either provide for the transportation of a necessary caretaker of perishable freight free of charge or require carriers to take care of stoves and replenish fuel in transit when such protection is required.

While carriers may provide by definite tariff provisions, free

from undue discrimination, for the advancement of storage or transfer charges, the commission is without authority to compel them to do so.

In accordance with established law, classification properly may not be predicated upon the use to be made of an article. Use may, however, be considered as evidence of value. Value has a bearing upon rating in the classification.

The restriction of the mixture of machinery and machines to articles "necessary for the initial equipment" is unjustly discriminatory. If it is found necessary to restrict the mixture, this should be done by placing a limitation upon the quantity of each article that may be shipped in a mixed car.

In connection with the sliding scale of minima provided by rule 6-B, rules protecting the minimum on the size of car ordered, similar to those in effect in western trunk line exceptions to the classifications, and in accord with our decision in *Noble v. B. & O. R. R. Co.*, 22 I. C. C., 432, should be incorporated in western classification.

In instances where it is difficult to secure the actual weight of articles shipped, estimated weights per unit may be used. The standard weights per unit must be fair and should be the result of careful investigation. The simplicity and ease of determination under this system are commendable.

Individual items considered in this report are so numerous and varied that no reference can be made to them in the headnotes.

It is expected that carriers will revise No. 51 and direct the future development of classification in accordance with the views expressed in this report. (25 I. C. C., 442.)

STATE COMMISSIONS.

The Arkansas railroad commission has adopted "reciprocal" demurrage rules, to become effective January 1, providing for penalizing the railways at the rate of $1 per car for the first and second days, $2 for the third day, $4 for the fourth day, $5 for the fifth day, and each additional day, for failure to furnish cars when ordered by shippers. But the railways, so far as we have learned, continue to limit the charge against consignees to one dollar a day.

COURT NEWS.

The government has filed a complaint in the United States district court at Los Angeles in a suit against the Southern Pacific Company and subsidiary oil and land companies, attacking the railway's title to 45,726 acres of supposed mineral-bearing land in Fresno county, Cal. The action is based upon provisions of the act of Congress requiring the department of the interior to exclude mineral-bearing lands in issuing patents to railways.

Three judges of the federal court at Portland, Ore., have issued a temporary injunction on application of the railways of the state, restraining the enforcement of the law prescribing a percentage relation between the various classes of freight, which was passed by the voters at the recent election under the initiative. The railways were required to file bonds amounting to $55,000. The court overruled the demurrers of the attorney general to the petition of the railways, and stated that the entire issue should be disposed of within thirty days.

Judges Warrington, Knapp and Dennison in the United States Circuit Court at Columbus, Ohio, December 30, handed down a decision in the case of the government against the Lake Shore & Michigan Southern, the Chesapeake & Ohio, the Hocking Valley, the Toledo & Ohio Central, the Kanawha & Michigan, the Zanesville & Western, the Sunday Creek Coal Company, the Continental Coal Company and the Kanawha & Hocking Coal and Coke Company in favor of the government, declaring the roads guilty of restraint of trade in violation of the Sherman law. The government charged the railroads with attempting to control the mining, transportation and sale of bituminous coal from the mining districts of western Pennsylvania, West Virginia and Ohio. The Hocking Valley was accused of being the head of the alleged combination and, through its influence over the capital stock of other railroads and coal companies, with having decided the output of coal from these regions.

Railway Officers.

Executive, Financial and Legal Officers.

D. C. Eccles has been elected president of the Sumpter Valley, with headquarters at Ogden, Utah, succeeding his father, the late David Eccles.

George W. Perkins, chairman of the board of directors of the Pere Marquette, has resigned from the board, and Samuel M. Felton, president of the Chicago Great Western, also a receiver of the Pere Marquette, has been elected president of the Pere Marquette.

M. C. Kennedy, vice-president and general superintendent of the Cumberland Valley, has been elected president succeeding James McCrea, and Samuel Rea, president of the Pennsylvania Railroad, has been elected also vice-president of the Cumberland Valley, succeeding Mr. Kennedy, and president of the Pennsylvania Tunnel & Terminal, succeeding James McCrea.

G. L. Peck, general manager of the Pennsylvania Lines West of Pittsburgh, has been elected fifth vice-president in charge of the transportation department. C. M. South, chief clerk to first vice-president, has been appointed assistant to the first vice-president, and the following have been appointed assistant comptrollers: J. B. Brittain, first assistant to the comptroller, J. W. Orr, second assistant to the comptroller, and John Hurst, general accountant, all with headquarters at Pittsburgh, Pa.

Oswald J. DeRousse, whose appointment as general assistant to the president of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., has been announced in these columns, was born on February 18, 1867, and entered the service of the Pennsylvania Railroad on July 18, 1884, as a telegraph operator, at Philadelphia. On June 28, 1885, he was transferred to the service of the New York, Philadelphia & Norfolk, in the office of A. J. Cassatt, president, where he remained until March, 1897, when he was elected secretary of that company. Upon the election of Mr. Cassatt to the presidency of the Pennsylvania Railroad, on June 9, 1899, Mr. DeRousse was transferred to Broad street station and appointed chief clerk of the office of the president, which position he held at the time of his recent appointment as general assistant to the president of the same road, as above noted.

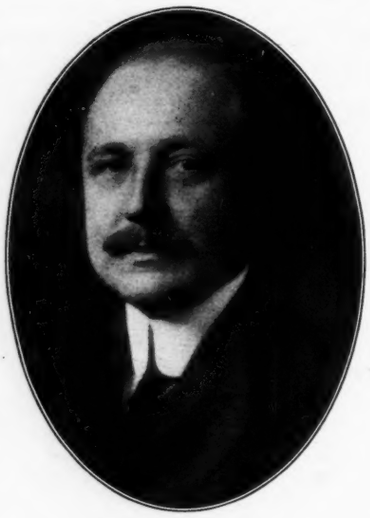
O. J. De Rousse.

The Chicago, Milwaukee & Puget Sound will hereafter be operated as the Puget Sound Lines of the Chicago, Milwaukee & St. Paul. H. R. Williams, president of the Puget Sound, has been elected vice-president with office at Seattle, Wash., and A. M. Ingersoll, vice-president of the Puget Sound, is vice-president at Tacoma. All subordinate officers of the legal and accounting departments of the Chicago, Milwaukee & Puget Sound are appointed to the same positions, respectively, with the Chicago, Milwaukee & St. Paul.

Ivy Ledbetter Lee, whose appointment as executive assistant, to the president of the Pennsylvania Railroad, has been announced in these columns, was born at Cedartown, Ga., on July 16, 1877; after graduation from Princeton University with the degree of A. B. in 1898, he did post-graduate work at Harvard and Columbia universities. He was then engaged in editorial work until his appointment as press representative of the anthracite coal operators, the Pennsylvania Railroad and other corporations. From 1908 to 1909 he was in charge of the publicity bureau of the Pennsylvania Railroad, and since 1910 was general European manager for Harris, Winthrop & Company, bankers,

and now returns to the Pennsylvania Railroad as executive assistant to the president, with office at Broad street station, Philadelphia.

Albert John County, who has been appointed special assistant to the president of the Pennsylvania Railroad, as has been announced in these columns, was born in Dublin, Ireland, on August 1, 1871. He received his early education in that city, and was graduated from the University of Pennsylvania, Wharton School of Finance, Transportation and Accounting, in 1908, as Bachelor of Science in economics. He began railway work in July 1885, in the purchasing department of the Great Southern & Western Railway, of Ireland. On November 20, 1890, he entered the service of the Pennsylvania Railroad, as clerk in the secretary's department. In June, 1898, he was appointed chief clerk, and on December 1, 1900, was made assistant to the secretary. He was appointed assistant secretary of the Pennsylvania Railroad in February, 1901, and later of the Philadelphia, Baltimore & Washington, the Northern Central, and other companies in the Pennsylvania Railroad System East of Pittsburgh and Erie, and also superintendent of the Pennsylvania Railroad Employees' Saving Fund. Since June, 1906, he has served as assistant to Samuel Rea, vice-president, and he now goes with him to the president's office. He is also secretary of the Richmond-Washington Company. Mr. County served with Mr. Rea as one of the mediators in the New York subway situation.



A. J. County.

Operating Officers.

The title of G. W. Clark, superintendent of the Central New England, with office at Hartford, Conn., has been changed to general superintendent.

J. G. Code, general superintendent of the Wheeling & Lake Erie, has been appointed general manager of the Wabash-Pittsburgh Terminal, with headquarters at Pittsburgh, Pa., succeeding H. W. McMaster, resigned.

H. W. McMaster, receiver and general manager of the Wabash-Pittsburgh Terminal, has been appointed general manager of the Wheeling & Lake Erie, with headquarters at Cleveland, O. The position of general superintendent, heretofore held by J. G. Code, has been abolished.

D. J. Evans, trainmaster of the Lake Shore & Michigan Southern at Toledo, Ohio, has been appointed assistant superintendent of the Toledo division, succeeding W. F. Schaff, promoted, and W. H. Sullivan has been appointed trainmaster of the Toledo division, succeeding Mr. Evans.

J. A. Shepherd, general manager of the Western Maryland, at Baltimore, Md., having resigned, his former position has been abolished and A. R. Merrick, superintendent of the Saginaw-Ionia division of the Pere Marquette, with office at Saginaw, Mich., has been appointed general superintendent of the Western Maryland, with office at Baltimore.

Benjamin McKeen, general manager of the Vandalia, with office at St. Louis, Mo., has been appointed general manager of the Pennsylvania Lines West of Pittsburgh, succeeding G. L. Peck, promoted, and E. T. Whiter, superintendent of the Eastern division of the Northwest system, has been appointed general superintendent of the Northwest system, succeeding A. M. Schoyer, both with headquarters at Pittsburgh, Pa. Mr. Schoyer's new position has not yet been announced, as the meeting of the directors of the Vandalia has not yet taken place.

H. W. Sheridan, superintendent of the Sacramento division of the Southern Pacific at Sacramento, Cal., has been appointed general superintendent of the Louisiana Western Railroad and Morgan's Louisiana & Texas Railroad & Steamship Company, the Louisiana lines of the Southern Pacific, with headquarters at New Orleans, La., succeeding W. M. Hobbs, resigned to engage in other business.

E. E. Gray, assistant division superintendent of the Denver & Rio Grande at Gunnison, Colo., has been appointed assistant superintendent of the First division, with office at Pueblo, Colo., succeeding R. T. McGraw, who has been appointed superintendent of the Fourth division, with headquarters at Alamosa, Colo., to succeed I. H. Luke, who takes the place of O. J. Ogg, superintendent of the Second division at Salida, Colo.

The Chicago, Milwaukee & Puget Sound hereafter will be operated as the Puget Sound Lines of the Chicago, Milwaukee & St. Paul. P. C. Hart, general superintendent of the Puget Sound, has been appointed general superintendent, with office at Seattle, Wash., and all subordinate officers of the operating department of the Chicago, Milwaukee & Puget Sound are appointed to the same positions with the Chicago, Milwaukee & St. Paul.

Traffic Officers.

E. D. Perkins has been appointed general freight and passenger agent of the Bartlett Western, with office at Bartlett, Tex., succeeding E. J. Fitzgerald, promoted.

Thomas G. Smiley, general freight agent of the Western Maryland, at Baltimore, Md., has been appointed freight traffic manager in charge of the freight traffic department, with office at Baltimore, and his former position has been abolished.

A. K. Ragsdale, traveling passenger agent of the San Antonio & Aransas Pass at San Antonio, Tex., has been appointed general baggage agent, with headquarters at San Antonio, in place of I. N. Turner, who hereafter will have charge of the ticket requisitions.

J. B. Payne, who recently was appointed assistant general freight agent of the Louisiana Lines of the Texas & Pacific, with headquarters at New Orleans, La., has been appointed assistant general freight agent with office at Dallas, Tex., succeeding H. L. Redfield, resigned.

J. T. Hendricks, whose appointment as general traffic manager of the Missouri Pacific, with headquarters at St. Louis, Mo., was announced in our issue of December 27, will also have jurisdiction over the St. Louis, Iron Mountain & Southern. A sketch of Mr. Hendricks' railway career was published in the *Railway Age Gazette* of November 1, 1912, page 857.

R. J. McKay, general passenger agent of the Chicago & Alton, at Chicago, has been appointed first assistant general passenger agent with headquarters at St. Louis, Mo., to succeed T. G. Roehm, resigned, and the office of general passenger agent is abolished. W. C. Mueller, city passenger and ticket agent at St. Louis, has been appointed general agent of the passenger department, with office at St. Louis. O. P. Bennett has been appointed general agent of the freight department, with office at Minneapolis, Minn., and A. F. Sullivan has been appointed traveling freight agent, with office at Minneapolis.

J. G. Hollenbeck, assistant general passenger agent of the St. Louis, Iron Mountain & Southern, at Little Rock, Ark., has been appointed general passenger agent of the Missouri Pacific-Iron Mountain System, with office at St. Louis, Mo., succeeding B. H. Payne, who has been assigned to other duties in the passenger department at St. Louis, on account of continued ill health. F. E. Schroeder, chief clerk to the passenger traffic manager, has been appointed assistant general passenger agent of the Iron Mountain at Little Rock, succeeding Mr. Hollenbeck, and H. H. Butler, chief rate clerk in the passenger traffic department of the Missouri Pacific, has been appointed assistant general passenger agent, with headquarters at St. Louis, in charge of rates, tariff bureau, etc.

The Chicago, Milwaukee & Puget Sound will hereafter be operated as the Puget Sound Lines of the Chicago, Milwaukee & St. Paul. R. M. Calkins, traffic manager of the Puget Sound, has been made traffic manager, with office at Seattle, Wash. J. R. Veitch, assistant traffic manager of the Puget Sound, has

been appointed assistant to the traffic manager, with headquarters at Chicago. F. D. Burroughs, general freight agent of the Puget Sound, has been appointed general freight agent, with office at Seattle. G. W. Hibbard, general passenger agent of the Puget Sound, has been appointed general passenger agent, with office at Seattle, and all subordinate officers of the traffic department of the Chicago, Milwaukee & Puget Sound are appointed to the same positions with the Chicago, Milwaukee & St. Paul.

Engineering and Rolling Stock Officers.

Michael McGraw has been appointed master mechanic of the Chicago & Alton, with headquarters at Bloomington, Ill., to succeed W. E. Ladley, resigned.

The Chicago, Milwaukee & Puget Sound hereafter will be operated as the Puget Sound Lines of the Chicago, Milwaukee & St. Paul, and E. O. Reeder, chief engineer of the Puget Sound, has been appointed assistant chief engineer, with office at Seattle, Wash.

R. E. Wallace has been appointed supervisor of locomotive operation of the Chicago Terminal and Illinois divisions of the Rock Island Lines, with headquarters at Chicago. S T. Patterson has been appointed supervisor of locomotive operation of the Arkansas division, with office at Little Rock, Ark. F. Connolly has been appointed supervisor of locomotive operation of the Kansas City Terminal and Kansas divisions, with headquarters at Herington, Kan., and C. S. Yeaton has been appointed supervisor of locomotive operation of the Oklahoma division, with office at El Reno, Okla.

W. J. Tollerton, mechanical superintendent of the Rock Island Lines, with office at Chicago, has been appointed general mechanical superintendent of the Rock Island Lines in full charge of the mechanical department. T. Rumney, assistant to second vice-president in charge of the mechanical department having resigned, his former position has been abolished. Mr. Tollerton was born in 1870 at St. Paul, Minn., and was educated in the public schools, and in high school. He began railway work as a machinist apprentice on the St. Paul & Duluth, now a part of the Northern Pacific, and after a short while was a fireman on the Omaha Railway. He went to the Union Pacific in 1890 as foreman, and afterwards was general foreman. In 1896 he was appointed master mechanic of the Utah division of the Oregon Short Line, and in 1903 was made master mechanic of the Idaho, Utah and Montana divisions of the same road with office at Pocatello, Idaho. He went to the Rock Island in July, 1906, as superintendent of motive power in charge of lines west of the Mississippi river, with office at Topeka, Kan., and was promoted in April, 1907, to assistant general superintendent of motive power of the Rock Island Lines, with headquarters at Chicago. In May, 1912, his title was changed to mechanical superintendent.

W. J. Tollerton

Purchasing Officers.

The office of H. W. Davies, purchasing agent of the Norfolk Southern, at Norfolk, Va., has been abolished, and Mr. Davies has been assigned to other duties.

W. G. Phelps, chief clerk to the second vice-president of the Pennsylvania Lines West of Pittsburgh, has been appointed assistant purchasing agent, with headquarters at Pittsburgh, Pa.

Special Officers.

F. G. Athearn, manager of the bureau of economics of the Southern Pacific, with headquarters at San Francisco, Cal., has resigned to engage in other business, effective January 1.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE LEHIGH VALLEY has ordered 10 mikado locomotives from the Baldwin Locomotive Works.

THE DELAWARE & HUDSON has ordered 15 consolidation locomotives from the American Locomotive Company.

THE CAROLINA & NORTH WESTERN has ordered 4 consolidation locomotives from the Baldwin Locomotive Works.

THE HARRIMAN LINES are closing negotiations for about 200 locomotives with the Baldwin Locomotive Works and the American Locomotive Company.

THE CUBA RAILROAD has ordered 4 ten-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 18 in. x 24 in., the diameter of the driving wheels will be 52 in., and the total weight in working order will be 127,000 lbs.

CAR BUILDING.

THE NEWBURGH & SOUTH SHORE is in the market for 175 freight cars.

THE MICHIGAN CENTRAL will build 400 box cars at the company's shops.

THE LEHIGH VALLEY is considering the purchase of some passenger equipment.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 500 gondola cars from the Standard Steel Car Company, and is in the market for 1,000 box cars, 200 refrigerator cars, and 50 caboose cars.

IRON AND STEEL.

THE NEW YORK CENTRAL LINES have ordered about 2,400 tons of structural material.

GENERAL CONDITIONS IN STEEL.—There has been a let up in the volume of orders placed during the past week, particularly as regards the orders placed with the independent companies. Orders on the books of all the companies are so heavy, however, that they continue to operate at as near their full capacity as possible, and they are experiencing difficulty in delivering shipments in contract time. The orders placed with the Steel Corporation have been satisfactory and a considerable increase in the unfilled tonnage on the books of that company is expected for December. Prices are firm, but there does not appear to be any indication of increases in the near future.

MACHINERY AND TOOLS.

THE GRAND TRUNK PACIFIC has called for tenders for machines, tools, motors, furnaces, cranes, etc., for the equipment of its car shops at Transcona, Manitoba. Specifications and forms of tender may be obtained at the office of W. J. Press, mechanical engineer, Ottawa, Ont. All tenders must be in by February 13, 1913.

NORTH YORKSHIRE DALES RAILWAY, ENGLAND.—This company's bill will propose the incorporation of a company to construct railways which will in effect extend the Yorkshire Dales Railway from its present northern termination at Grassington so as to make junctions with the Northallerton & Hawes line of the North Eastern Railway at Leyburn and with the Richmond branch of the same company at Scorton. Running powers will be asked for over the Midland Railway from Colne to Skipton, over the Yorkshire Dales Railway from Skipton to Grassington, over the North Eastern Railway between Leyburn and Northallerton, with the use of these stations and intermediate stations, and over the North Eastern Railway between Scorton, Darlington and Middlesbrough, with the use of these stations and intermediate stations. Working and traffic arrangements are sought with the Midland, North Eastern and Yorkshire Dales railways.

Supply Trade News.

The Dearborn Drug & Chemical Works, Chicago, has changed its name to the Dearborn Chemical Company.

The Dressel Railway Lamp Works, New York, has discontinued its office in the Peoples Gas building, Chicago.

Samuel E. Barrett, president of the Barrett Manufacturing Company, Chicago, with office in that city, died on December 29, at the Johns Hopkins Hospital, Baltimore, Md.

The Bucyrus Company, Milwaukee, Wis., has moved its New York office from 50 Church street, to 30 Church street. This office is in charge of C. S. Reed, eastern sales manager.

W. P. Steele has been appointed assistant to the president of the American Locomotive Company, New York, with office in that city. Mr. Steele will perform the duties heretofore assigned to him and such other duties as may be assigned to him by the president.

J. B. Ennis has been appointed chief mechanical engineer of the American Locomotive Company, New York, with office in that city. Mr. Ennis will perform the duties formerly assigned to the vice-president in charge of engineering, except the chief engineer will report directly to the president on construction and shop engineering matters.

Charles Kennedy, railroad representative for Brown & Company, Inc., Pittsburgh, Pa., with office at Chicago, died on December 18, at Niagara-on-the-Lake, Ont., at the age of 70. Mr. Kennedy was first engaged in building railroads in the oil country in Pennsylvania, and later became a locomotive engineman on the old Chicago, Burlington & St. Paul. He was chairman of the grievance committee at the time of the strike of the Burlington enginemen. Later he was connected with the National Tube Company and the Ewald Iron Company, at Louisville, Ky. He has been railroad representative for Brown & Company since 1898. He is succeeded by George H. Likert, formerly master mechanic of the Union Pacific.

The plant of the H. W. Johns-Manville Company, at Manville, N. J., which has just been completed, consists of nine buildings, each having an average length of 1,000 ft., and each being a separate factory capable of being operated as an independent unit. The total combined floor area of all the buildings is about 1,000,000 sq. ft. These buildings are of fireproof construction, being of brick, steel and concrete with roofs of J-M Asbestos roofing. The lighting and ventilating systems are so arranged as to afford the best operating conditions for the employees. The plant is located on a tract of 320 acres and the company's five mile railroad connects directly with the Central of New Jersey, the Lehigh Valley, and the Philadelphia & Reading. About 3,000 men will be employed at this plant, making a total of 7,000 who are now employed by the company.

C. W. Kelly, who for some years past has been connected with Fairbanks, Morse & Co. as railroad salesman for the city of Chicago and territory west, has resigned this position and has taken offices in the People's Gas building, Chicago, under the firm name of the Kelly-Derby Company. The new company will handle a general line of waterworks supplies, as well as wire cloth screens, crucible and rubber accounts. Mr. Kelly for many years before his connection with Fairbanks, Morse & Co. was connected with the Chicago & North Western in various capacities. His last seven years with the road were spent as superintendent of bridges and buildings and water service. He is a member of the board of directors of the National Railway Appliances Association, and of the Bridge and Building Supply Men's Association. Mr. Derby was for several years connected with the United States Wind, Engine & Pump Company, later with Fairbanks, Morse & Co. for two years, and for the past two years has been president of the Tweedy, Hood & Finlen Company, which company has been merged with the Kelly-Derby Company.

TRADE PUBLICATIONS.

Unions.—The Jefferson Union Company, Lexington, Mass., has published an interesting little folder which outline the work of Bizmarck and discusses the advantages of Jefferson unions.

Railway Construction.

Burlington Belt Line.—Organized by residents of Burlington, Iowa, to build from Burlington southeast to Beardstown, Ill., about 65 miles.

Carolina Railroad.—Incorporated with a capital of $175,000 and headquarters at Kinston, N. C., to build from Kinston north to Snowhill, about 20 miles. The incorporators include I. C. Millard, M. S. Hawkins and H. Hanley, of Norfolk, Va., and W. H. Hayes, Kinston, N. C.

Minneapolis, St. Paul & Sault Ste. Marie.—A contract has been given Foley Brothers, Welch & Stewart, St. Paul, Minn., to build an extension from Ambrose, N. D., to a point in Montana 75 miles west of Ambrose.

Moberly, Huntsville & Randolph Springs.—Incorporated in Missouri with a capital of $500,000 to build from Randolph Springs, Mo., east to Moberly in Randolph county, 12 miles. The directors include C. H. Dameron, W. T. Dameron, G. P. Dameron and W. M. Evans, all of Huntsville, Mo.

Mount Ida, Ouachita Valley & Hot Springs.—An officer writes that in addition to the work being carried out under the direction of C. C. Godman, general manager and superintendent of construction, from Mount Ida, Ark., south to a connection with the St. Louis, Iron Mountain & Southern at North Caddo Gap, 10 miles, the company has projected a 40-mile extension from Mount Ida east to Hot Springs. Work on the extension is to be carried out during 1913. G. Cox, president, Mount Ida. (September 13, p. 491.)

National Railways of Mexico.—The report of this company for the year ended June 30, 1912, shows that four contracts were entered into during the year with the Department of Communications and Public Works of Mexico. Two of the contracts modify concessions already granted and the other two relate to the construction of new lines. The amended contracts cover the line between Durango in the state of the same name and Canitis, Zacatecas, with a branch to Sombrerete, a total of about 175 miles. This work is nearing completion, and it is expected that the lines will be put in operation soon. The contracts also include the line to connect Penjamo, Guanajuato, with Ajuno, Michoacan. The work is well advanced. The new concessions call for the construction of a line from a point on the Interoceanic near San Francisco, about 28 miles from Vera Cruz, to be built via Tamos to the Port of Matamoros, in the State of Tamaulipas, and for a line from Allende to San Carlos, both in the State of Coahuila, with the privilege of extending the line to Las Vacas, in the same state. Authority has also been given to the company to take up certain portions of the existing lines to a length corresponding to some of the lines covered by the new concessions. During the year the company also carried out a large amount of betterment work, including the protection of banks and drainage, grade reductions and changes of line, tunnel improvements, improvements to bridges, trestles and culverts and putting in heavier rails to replace lighter sections; also new ballast. The unexpected difficulties encountered in the construction of the line from Durango to Llano Grande have somewhat delayed the work; it is expected that the line will be put in operation before the close of 1912. On the line from Durango to Canitas, on a section of 100 miles out of Durango about all the grading and masonry work is finished and 64 per cent. of the track laying has been finished. Work is under way on the rest of the line. The company expects to have the work finished from Penjamo to Ajuno and the line open for operation before the close of 1912. A contract was let early in 1912 to build from Allende Coahuila to Las Vacas, on the Rio Grande, opposite Del Rio, Texas, 73.32 miles. It is now proposed, however, to build only 49.71 miles to the Hacienda of San Carlos. A contract was entered into with the federal government of Mexico in March, to build a coast line from Matamoros, to San Francisco, a total of 560.48 miles. Under the terms of the contract 63 miles must be finished in two years from the time of the making of the contract, and 63 miles must be finished each succeeding year; the whole line to be completed within ten years. A contract has been let for carrying out the work on the first 63 miles from Tampico south.

NIAGARA, ST. CATHARINES & TORONTO (Electric).—Application is being made to the Canadian parliament for an extension of time to build the following lines: From Port Colborne, Ont., easterly to Fort Erie and from Fort Erie to Niagara Falls; from Niagara Falls to Niagara on the Lake, thence to St. Catharines; from Welland westerly to Brantford; from the terminus of the St. Catharines and Niagara Central line to Fort Erie, and an extension via Hamilton to Toronto.

PACIFIC & HUDSON BAY.—Application is being made to the Canadian parliament for an extension of time to build from Kimsquit, B. C., at the head of Dean channel, northeast following the Dean river, Sigutla lake, Kwalchola lake, Entiaco river and the upper Nechaco river to Fort Fraser, thence via Fort St. James on Stuart lake, Fort McLeod, crossing the Parsnip river through the Pine river pass to Coalbrook, to Dunvegan along the Peace river to Peace River Landing, Alb., thence easterly via the headwaters of Bear river to Athabasca river and Fort McMurray, then crossing the Athabasca river and following the Clearwater and Churchill rivers to the proposed Canadian government Hudson Bay railway south of Washaiowaka lake and to Fort Churchill or Port Nelson on Hudson Bay. Permission is also asked to increase the capital from $5,000,000 to $25,000,000, and to authorize it to enter into agreements with other railways. W. F. Brougham, Vancouver, B. C., is acting for the applicants.

PARIS & MOUNT PLEASANT.—An officer is quoted as saying that as soon as the extension from Bogata, Tex., to Mount Pleasant, 28 miles, is put in operation it is the intention to extend the road northwest from Paris to Atoka, Okla., and to the Lehigh coal fields, about 60 miles, connecting with lines running to Oklahoma City. It is understood that an extension is to be built south from Mount Pleasant to a connection with the Missouri, Kansas & Texas, either at Daingerfield or at Pittsburg, about 15 miles. (June 7, p. 1263.)

RAILWAY STRUCTURES.

DALLAS, TEX.—It is announced that work is to be started within sixty to ninety days on a new union passenger station for the Dallas Union Terminal Company, which is to cost about $4,000,000. The city commissioners have passed the necessary ordinances, financial arrangements have been made, and the company has adopted the architect's plans. The building will be 350 ft. long, 210 ft. wide and 70 ft. high.

DULUTH, MINN.—The Duluth, Missabe & Northern will shortly let a contract for a new ore dock at the head of the lakes, to be built of concrete and steel, and to cost approximately $2,750,000. The dock will have 384 pockets of a storage capacity of 300 tons each.

MEXICO CITY, MEXICO.—The report of the National Railways of Mexico for the year ended June 30, 1912, shows that in order to provide a terminal station in the city of Mexico to accommodate all passenger and freight business, plans have been made and approved by the board of directors for a new station. No work has yet been done, but preliminary details are well advanced. Plans have also been made for putting up a new terminal station at San Luis Potosi. During the year new passenger stations were put up at Iguala, at Cuernavaca, at Colima and at Aguascalientes. New freight stations were built at Iguala and at Linares, and a combined passenger and freight station at Balsas.

ST. LOUIS, MO.—The St. Louis Southwestern has just completed a new freight house 750-ft. long, 30-ft. wide and 5 stories high, together with a yard of 10 tracks, a transfer platform 500-ft. long and a team track yard of 5 tracks.

SEATTLE, WASH.—The Chicago, Milwaukee & Puget Sound has taken out building permits for a new lumber dock and additions to its machine shops, roundhouse, blacksmith shop, woodworking shop and paint shop. Work is nearing completion on an ocean warehouse 500 x 175 ft.

SOUTH TACOMA, WASH.—The Northern Pacific has filed plans with the city for an addition to its shops in South Tacoma, including a new paint shop 144 ft. x 100 ft.

TACOMA, WASH.—The Chicago, Milwaukee & Puget Sound has filed plans with the city building inspector for new ocean docks of concrete steel construction.

Railway Financial News.

ATLANTA, BIRMINGHAM & ATLANTIC.—The federal court has appointed E. T. Lamb, general manager, as a co-receiver with H. M. Atkinson, succeeding S. L. Schoonmaker, resigned.

BALTIMORE & OHIO.—The following subsidiaries of the Baltimore & Ohio have been merged under the name of the Baltimore & Ohio Railroad in Pennsylvania: Pittsburgh & Connellsville, the Berlin Railroad, the Salisbury Railroad, the Mt. Pleasant & Broad Ford, the Ohio & Baltimore Short Line, the Somerset & Cambria, the Glenwood Railroad and the Fayette County Railroad.

CANADA SOUTHERN.—Ladenburg, Thalmann & Company, New York, are offering a part of the new $22,500,000 5 per cent. bonds at 106, yielding 4.68 per cent. income on the investment.

CHICAGO & NORTH WESTERN.—The Michigan railroad commission has authorized the issue of $10,000,000 equipment trust certificates. It is understood that no part of this issue is to be offered to the public at present.

DETROIT & CENTRAL NEW YORK.—Stockholders are to vote on January 13, on the question of leasing this road to the Delaware, Lackawanna & Western.

NEW YORK, NEW HAVEN & HARTFORD.—See an item in General News in regard to the contract with the Pullman Company.

NORWOOD & ST. LAWRENCE.—The New York Public Service Commission has authorized the company to sell $200,000 additional first mortgage bonds at 90.

PERE MARQUETTE.—George W. Perkins, chairman of the board, has resigned.

SAN DIEGO & ARIZONA.—It is rumored, according to press reports from San Diego, that Phelps, Dodge & Company, which own the El Paso & Southwestern, and a minority interest in the Rock Island Company, have bought the San Diego & Arizona, which runs from San Diego to Ysidro, Cal., 14 miles, and which started work some time ago on an extension through California, Lower California and Mexico towards Coyote Wells.

WHEELING & LAKE ERIE.—The receiver has been authorized to issue $2,425,000 receiver's certificates to pay for 1,300 freight cars, 20 locomotives, and to pay for bridge and dock work.

LONDON & SOUTH WESTERN RAILWAY, ENGLAND.—Widening between Twickenham and Richmond of the Windsor line and of the Kensington & Richmond line, and further money powers are among the chief objects of the bill to be promoted by this company. It is also proposed to cancel the existing leases of 1894 and 1902 to the company of the separate undertakings of the North Cornwall Railway known as the Launceston & Delabole and the Padstow lines, and to authorize a new lease in perpetuity to the company of the whole of the North Cornwall Railway undertaking, including the Launceston & Halwill, Launceston & Delabole, Wadebridge and Padstow lines.

NORTHERN JUNCTION RAILWAY, ENGLAND.—The Northern Junction Railway, a new company, seeks incorporation with power to construct 20 railways making connections with existing lines in the outskirts of London. The proposed lines will make junctions with the London & South Western and North & South Western Junction railways at Brentford, with the Ealing & South Harrow line of the Metropolitan District Railway near Hanwell, with the Acton & High Wycombe line of the Great Western Railway at Brentham Halt, with the Great Central Railway at Wembley Hill, with the Metropolitan & Great Central Joint Railway at Wembley Park, and with the following lines of the Great Northern Railway, *i. e.*, with the High Barnet branch at Finchley, and with the Enfield branch and the main line at Wood Green. The places to be traversed by the proposed lines will be Brentford, Ealing, Acton, Hanwell, Greenford, Perivale, Twyford, Wembley, Kingsbury, Hendon, Finchley, Friern Barnet, Hornsey, Wood Green and Southgate. The promoters ask for authority to enter into working and other agreements with the Great Central and Great Northern railways.

[ADVERTISEMENT.]

ANNUAL REPORT.

FOURTH ANNUAL REPORT FERROCARRILES NACIONALES DE MEXICO.

(NATIONAL RAILWAYS OF MEXICO.)

MEXICO OFFICE: SEGUNDA CALLE DE BOLIVAR, No. 19.

NEW YORK OFFICE: No. 25 BROAD STREET.

To the Shareholders:

On behalf of the Board of Directors and in compliance with the provisions of Article 48 of the By-Laws of the Company, I have the honor to present to you the following report relative to the affairs of the Company for the fiscal year July 1, 1911, to June 30, 1912.

EXCHANGE AND PAYMENT OF SECURITIES CALLED FOR CONVERSION.

The deposit of securities under the Plan for the Readjustment and Union of Mexican Central Railway Company Limited and National Railroad Company of Mexico has continued, though in less number. The securities remaining undeposited are shown in the following

STATEMENT OF SECURITIES DEPOSITED TO JUNE 30, 1912, IN ACCORDANCE WITH THE PLAN OF APRIL 6, 1908.

SECURITIES OF MEXICAN CENTRAL RAILWAY COMPANY LIMITED.

	Issued.	Deposited.	Per Cent.	Outstanding.	Per Cent.
Priority Five Per Cent. Bonds ..	$6,597,000.00	$5,223,000.00	79.17	$1,374,000.00	20.83
First Mortgage Bonds	264,062.50	262,715.00	99.49	1,347.50	.51
Consolidated Mortgage Bonds ...	109,020,000.00	109,001,000.00	99.98	19,000.00	.02
First Income Bonds	32,706,000.00	32,476,900.00	99.30	229,100.00	.70
Registered Income Bonds	325,200.00	317,000.00	97.48	8,200.00	2.52
Second Income Bonds	11,284,000.00	11,261,000.00	99.80	23,000.00	.20
Stock	59,127,100.00	59,064,400.00	99.89	62,700.00	.11
Total	$219,323,362.50	$217,606,015.00	99.21	$1,717,347.50	.79

SECURITIES OF NATIONAL RAILROAD COMPANY OF MEXICO.

	Issued.	Deposited.	Per Cent.	Outstanding.	Per Cent.
Preferred Stock..	$32,000,000.00	$31,998,100.00	99.99	$1,900.00	.01
Second Preferred Stock	22,043,600.00	22,002,600.00	99.81	41,000.00	.19
Deferred Stock..	11,021,800.00	11,021,800.00	100.00	.....	.00
Common Stock...	284,600.00	156,500.00	54.99	128,100.00	45.01
Total	$65,350,000.00	$65,179,000.00	99.74	$171,000.00	.26

TOTAL SECURITIES OF BOTH COMPANIES.

	Issued.	Deposited.	Per Cent.	Outstanding.	Per Cent.
Bonds and Stocks.	$284,673,362.50	$282,785,015.00	99.34	$1,888,347.50	.66

NOTE.—All of the above amounts are in U. S. Currency.

As will be noted from the foregoing statement, practically all the securities comprehended in the Plan have now been deposited. This result should be a source of satisfaction to all concerned, and is due largely to the efforts of the Readjustment Managers as well as to the fact, as was mentioned in last year's report, that on July 1, 1911, that is to say, at the beginning of the present fiscal year, the First Mortgage Bonds, Consolidated Mortgage Bonds and Registered Income Bonds of the Mexican Central Railway Company Limited matured, and such as had not been deposited previously were duly paid by your Company in accordance with the obligation assumed by it on the acquisition of the properties of the Central Company.

Having regard, therefore, to the small amount of securities still outstanding in comparison with the total number called for deposit under the Plan of April 6, 1908, it may be considered that the conversion has been practically consummated.

ISSUE OF BONDS AND NOTES.

As was mentioned at the Ordinary General Meeting last year, on account of the unfavorable financial conditions prevailing, it was not thought advisable to dispose of the bonds of the Company then in its treasury, and that accordingly two series of notes had been issued, one series maturing at the end of two years, the other at the end of one year. The latter series, amounting to £1,000,000 Sterling became due in the fiscal year under review, and was paid at maturity, the $6,150,000 Prior Lien Bonds pledged as collateral security therefor being returned to the Company. The two year notes do not mature until June 1, 1913. The interest on both series of notes was paid when due.

The Board of Directors had hoped to be able to sell at a satisfactory price during the course of the present year all or a part of the treasury bonds, but unfortunately the markets for these securities showed no improvement over those of the previous year. Consequently, it was decided to defer any such sale until there was some improvement.

The inability to dispose of the treasury assets necessitated our making other arrangements for the funds to meet the financial requirements of the Company, and negotiations were successfully conducted for a loan of $13,000,000 United States currency for one year. This loan was obtained in New York, and bears interest at the rate of five per cent. per annum. The Company deposited as collateral security therefor, $12,500,000 Prior Lien Bonds and $6,000,000 Guaranteed General Mortgage Bonds.

In consideration of the said loan, an option until August 15, 1912, was given for the purchase of the whole or any part of certain of the Company's Prior Lien and General Mortgage Bonds. Said option, however, was not exercised.

Of the other outstanding obligations of the Company, I beg to advise that Note No. 4, the last of those issued to the Southern Pacific Company at the time of acquiring from it certain shares of The Mexican International Railroad Company, was duly paid at maturity.

During the year under review Prior Lien Bonds were authenticated by the Trustee and delivered to the Company to the face amount of $2,526,368.56, in reimbursement of expenditures made to December 31, 1910, for improvements and betterments and in the construction of the line from Durango to Llano Grande.

SUBSIDIARY COMPANIES.

The operation of the various Subsidiary Companies and of leased and controlled lines has been continued, particular attention having been given to improving the properties. To this end and to aid in their development and progress financial assistance was given some of them during the year, it being considered inadvisable for said companies to endeavor to obtain the necessary funds in foreign markets owing to the difficulty of sale, at satisfactory prices, of Mexican securities.

To June 30, 1912, there had been loaned to the Vera Cruz to Isthmus Railroad the sum of $3,255,733.33 (pesos), at six per cent. per annum, to enable that company to meet expenditures in connection with the construction of branch lines. To same date there had been loaned to the Pan-American Railroad Company, under terms similar to those mentioned above, the sum of $2,102,583.33 (pesos) in order that it might meet its financial requirements.

From the amounts loaned to these Companies there should be deducted from that to the Vera Cruz to Isthmus Railroad $127,990.73 (pesos), and from that to the Pan-American Railroad Company $1,157,578.72 (pesos) representing deficit from the result of operations of the former road for the year ended June 30, 1912, and of the Pan-American for the two years ended the same date, caused principally by heavy expenditures for renewals and betterments. As the shareholders are aware, under the terms of the contracts whereby the shares of said companies were acquired, this Company obligated itself to meet such deficits.

Pursuant to the terms of the contract covering the purchase of shares of the Pan-American Railroad Company, the guaranty of Ferrocarriles Nacionales de Mexico has been placed upon bonds of said Company to the amount of $136,000 (pesos) on its First Mortgage Five Per Cent. Bonds and to an amount of $2,968,000 (pesos) on its General Mortgage Five Per Cent. Bonds.

NEW CONCESSIONS.

CONSTRUCTION OF LINES AND WORKS.

The Board has satisfaction in advising that during the year covered by this report, four contracts were entered into between the Department of Communications and Public Works of the United States of Mexico and the Company. Two of said contracts modify concessions already granted, the other two relate to the construction of new lines.

The amended contracts cover (1) the line between Durango, in the State of same name, and Cañitas, in the State of Zacatecas, with a branch line to Sombrete in the latter State, a total distance of approximately 277 kilometers; the construction of which has been pushed vigorously, is now nearing completion, and it is hoped will soon be in operation. And (2) the line which will unite Penjamo, in the State of Guanajuato, with Ajuno, in the State of Michoacan, work on which is also well advanced.

Of the new concessions one is for the construction of a line from a point on the Interoceanic Railway, near the Station of San Francisco (approximately 44 kilometers from Veracruz) which will pass by Tamos (on the San Luis-Tampico Line), and terminate at the Port of Matamoros, in the State of Tamaulipas, thus practically uniting, in connection with the lines of the Company already constructed, the Ports of Veracruz, Tampico and Matamoros and traversing a large extent of country adjacent to the Gulf of Mexico. The importance of this concession is obvious.

The other new concession is for a line from the station of Allende (on the former Mexican International Railroad) to San Carlos, both in the State of Coahuila, and with the right of extending said line to Las Vacas, in the same State.

As will be seen from the Balance Sheet which is to be presented, the amount expended in the construction of the new lines mentioned and of the Durango to Llano Grande line exceeds the sum of $10,000,000.00 pesos.

In these concessions authority is given the Company to take up certain portions of its existing lines to a length corresponding to some of the lines covered by the new concessions. This will permit of the suppression of parallel or unnecessary lines, and consequently the discontinuance of an unprofitable service which under the original concessions covering said lines, would have to be continued. It will also allow a more logical distribution of transportation facilities throughout the Republic, which was one of the objects of the consolidation of the National and Central lines.

To enable the Company to proceed with the work of taking up the lines referred to, steps were taken to obtain the consent thereto as required by the provisions of the Company's mortgages. It is satisfactory to report that same has been received.

In respect of important works other than the construction of lines of railway, mention should be made of the authority given by the Board of Directors for the construction of a new terminal and shops at San Luis Potosi, to provide adequate facilities to meet its growing demands as a railroad center; also of the erection of two large steel bridges on the Monterey Division across the Pilon and San Juan Rivers, at a cost of $271,103.10 and $324,840.02 (pesos), respectively.

The attention of the Shareholders should be directed to another important piece of work, namely, the construction of a large Terminal Station at the City of Mexico, which has been receiving consideration for the past three years. During the year to which this report refers, definite plans were formulated by the Executive President of the Company and drawings made for that part of the Terminal proposed to be utilized as a Passenger Station. These drawings were submitted to the Board of Directors, and in view of the recommendation of the Executive, the construction of the Passenger Station, at an approximate cost of $4,000,000 (pesos), has been authorized. Although the decision on the part of the Board of Directors was reached after the 30th of June last, mention thereof is made in this report in view of its importance. Definite plans with respect to the construction of the Freight Station have not been decided upon, and the matter is still under consideration.

The report of operations rendered by the Executive President of the Company to the Board of Directors is herewith submitted, and by examining same the shareholders will appreciate the work done by the Management in construction, maintenance and operation of the lines as well as the present physical condition of the railway lines and property of the Company.

BOARD OF DIRECTORS.

During the year covered by this report there were no changes in the personnel of the Board of Directors. The duties of the Directors resident in Mexico as well as those forming the New York Local Board, were performed with regularity and in compliance with the provisions of the By-Laws of the Company.

In accordance with Clause Fourteen of the Deed of Incorporation, the terms of office of the twenty-one Directors of the Company expire today,

and the Board of Directors for the first time will be renewed in its entirety. The Directors elected at this meeting will hold office until the Ordinary General Meeting of the shareholders to be held in the year 1913. Two Commissaries and two substitutes also have to be elected to hold office until the Ordinary General Meeting of 1913, as the terms of office of those elected last year expire on this date.

RESULTS OF OPERATION AND DIVIDENDS.

Unfortunately, as the shareholders know, a state of revolution has continued in the Republic, principally in the northern part of the country and in the States of Morelos and Guerrero, which has been the cause of attacks upon and damage to transportation lines, resulting in the interruption and suspension of traffic for a greater or less time. This has proved detrimental to the Company not only through loss of traffic, but also on account of actual damage done to its lines and property. Nevertheless, as will be seen from the Income Account for the fiscal year ended June 30 last, the gross receipts of the Company almost equaled those obtained in the previous year, the significance of which is worthy of notice, as it manifests the stability of the Company as well as the vitality of the nation. Moreover, the Management of the Company, following a policy which merits the highest praise, has endeavored to reduce the cost of operation to a minimum, and as a consequence the net results obtained during the past fiscal year exceed those of the previous fiscal year by over $1,000,000 (pesos); the net income for the year 1911-1912 reaching the sum of $21,888,033.49 (pesos), while for the year 1910-1911 it amounted to $20,504,140.19 (pesos).

In view of these results of which the Board of Directors takes cognizance from month to month, and following the custom of former years and in exercise of the authority conferred by Article 50 of the By-Laws, it authorized the payment of two semi-annual dividends of two per cent. each on the Company's First Preferred Shares, which together constitute the four per cent. maximum that these shares may receive. The semi-annual dividends were duly paid as in former years, and the Board hopes that this action will be approved by the meeting.

The Balance Sheet, the Profit and Loss Account and the Income Account for the fiscal year July 1, 1911, to June 30, 1912, which will be submitted to the Shareholders, having been approved by the Board of Directors, were passed to the Commissaries, who in turn had them audited by Messrs. Price, Waterhouse & Company, Chartered Accountants. The latter, after making a careful examination of the accounts, issued their certificate relative thereto. The Commissaries have rendered their report recommending the approval of these accounts, which report will be submitted to the meeting.

The foregoing embraces what the Board considers of sufficient importance to be brought to the attention of the Shareholders, but at the same time it would be pleased to furnish any further information or explanation that may be desired by the meeting. The book containing the minutes of meetings of the Board of Directors as well as all documents relating thereto are at the disposal of the Shareholders in order that they may be fully cognizant of the work performed by it.

The Board begs to thank the Shareholders for the confidence reposed in it, and to express the satisfaction it would afford the members to know that their actions during the time they have directed the affairs of the Company are approved.

Mexico, D. F., October 2, 1912.

LUIS ELGUERO,
Chairman of the Board of Directors.

FERROCARRILES NACIONALES DE MEXICO.

(NATIONAL RAILWAYS OF MEXICO).

MEXICO, D. F., September 19, 1912.

Sr. Lic. D. Luis Elguero,
Chairman of the Board, Mexico.

DEAR SIR:

I beg to submit the following report of the operations of the Company for the fiscal year ended June 30, 1912:

RESULTS OF OPERATION.

The following statement shows in a condensed form the results for the year:

	Mexican Currency.	
The Gross Earnings from all sources were		$61,447,790.71
The total Expenses of Operation were		38,435,254.74
Leaving Net Receipts of		$23,012,535.97
To which add:		
Interest and Dividends on Securities owned	$937,290.54	
Sundry interests	721,361.95	
Other Receipts	141,283.88	
		1,799,936.37
Making		$24,812,472.34
From which deduct:		
Taxes and Rentals	$548,821.21	
Operating Deficit of Subsidiary Companies	975,617.64	
Sundry Adjustments of Operating Expenses:		
Provision for expenses for repair and replacement of equipment	1,300,000.00	
Reserve for Additions and Betterments, in suspense	100,000.00	
		2,924,438.85
		$21,888,033.49
And:		
Interest on Funded Debt, Equipment and Collateral Trusts and Notes Payable		19,403,457.17
Leaving Balance carried to Profit and Loss Account		$2,484,576.32
And deducting:		
Five Per cent. of Net Profits transferred to Reserve Fund	$124,228.82	
Dividend on First Preferred Shares, four per cent.	2,306,632.00	
Government Bonds forfeited account failure to complete Jimenez to Parral line	7,000.00	
Adjustment of market value of Bonds owned	41,587.38	
		2,479,448.20
Leaving as Net Surplus for the year ended June 30, 1912		$5,128.12
To which add:		
Net Surplus at June 30, 1911		561,924.33
Which gives a total Net Surplus at June 30, 1912, of		$567,052.45

The succeeding statement, which it is thought will be of interest, shows somewhat more in detail the results for the four years that the Company has been in operation.

FERROCARRILES NACIONALES DE MEXICO.

COMPARATIVE STATEMENT OF INCOME ACCOUNT FOR THE FOUR YEARS ENDING JUNE 30, 1909, TO 1912.

	MEXICA CURRENCY.			
	1908-1909.	1909-1910.	1910-1911.	1911-1912.
GROSS EARNINGS.				
Freight	$40,901,478.00	$45,477,881.48	$45,197,748.27	$43,859,606.81
Passenger	11,274,085.80	12,234,007.92	12,657,110.32	13,548,386.95
Express	1,979,778.51	1,954,532.43	2,066,544.67	2,070,914.81
Miscellaneous	1,603,464.44	1,816,725.59	2,013,017.79	1,968,882.14
Total	$55,758,806.75	$61,483,147.42	$61,934,421.05	$61,447,790.71
OPERATING EXPENSES.				
Maintenance of Way and Structures	$7,483,894.80	$9,704,299.84	$11,161,931.14	$11,340,034.17
Maintenance of Equipment	7,158,947.16	7,766,515.84	8,788,387.92	9,687,119.41
Conducting Transportation	16,343,698.64	17,106,344.52	17,141,417.30	15,435,621.96
General Expenses	2,227,829.76	2,151,158.16	2,187,608.21	1,972,479.20
Total	$33,214,370.36	$36,728,318.36	$39,279,344.57	$38,435,254.74
EARNINGS OVER OPERATING EXPENSES	$22,544,436.39	$24,754,829.06	$22,655,076.48	$23,012,535.97
INCOME FROM INVESTMENTS	1,093,760.74	1,167,131.78	753,562.60	937,290.54
SUNDRY INTEREST LESS EXCHANGE	290,133.54	59,252.18	191,329.90	721,361.95
Total	$23,928,330.67	$25,981,213.02	$23,599,968.98	$24,671,188.46
From which deduct:				
TAXES	$299,770.31	$410,753.94	$413,545.18	$478,607.42
RENTAL OF LEASED LINES	77,397.10	67,076.51	70,045.64	70,213.79
OPERATING DEFICIT OF SUBSIDIARY COMPANIES	22,834.41	76,238.55	464,421.13	834,333.76
PENDING CHARGES ACCT. OPERATING EXPENSES	2,461,292.43	2,336,709.27	2,147,816.84	1,400,000.00
Total	$2,861,294.25	$2,890,778.27	$3,095,828.79	$2,783,154.97
NET REVENUE	$21,067,036.42	$23,090,434.75	$20,504,140.19	$21,888,033.49
From which deduct:				
INTEREST ON BONDED DEBT, ON EQUIPMENT AND COLLATERAL TRUSTS, ETC., AND ON NOTES PAYABLE	18,466,663.88	18,562,603.78	17,946,269.32	19,403,457.17
SURPLUS	$2,600,372.54	$4,527,830.97	$2,557,870.87	$2,484,576.32

NOTE.—The above figures for the years 1908-1909 and 1909-1910 include those for the Mexican International R. R. Co., which were published separately, as that line was not merged with Ferrocarriles Nacionales de Mexico until July 1, 1910.

AVERAGE LENGTH OF LINE OPERATED:

The average length of line operated during the year was 9,668.461 kilometers, or 6,007.739 miles.

GROSS EARNINGS.

As already stated, the total Gross Earnings from all sources amounted to $61,447,790.71: Mexican Currency, for details of which, as well as comparison with last year, your attention is invited to the following statement:

1910-1911. Earnings.	1910-1911. Percentage.		1911-1912. Percentage.	1911-1912. Earnings.
$44,320,766.34	71.56	Commercial Freight	70.34	$43,220,949.51
876,981.93	1.41	Construction Freight	1.04	638,657.30
12,657,110.32	20.44	Passenger	22.05	13,548,386.95
235,111.63	.38	Baggage	.35	215,046.92
2,066,544.67	3.34	Express	3.37	2,070,914.81
55,705.93	.09	Telegraph	.09	54,363.19
130,726.74	.21	Rentals	.26	158,539.52
44,517.39	.07	Floating Equipment	.05	33,084.72
1,546,956.10	2.50	Miscellaneous	2.45	1,507,847.79
$61,934,421.05	100.00		100.00	$61,447,790.71

The movement of commercial freight by classes differed but slightly from that of the previous year, as will be noted from the following table:

1910-11. Percentage.		1911-1912. Percentage.
12.88	Forest Products	11.56
22.33	Agricultural Products	23.48
3.15	Live Stock and Animal Products	4.01
50.90	Mineral Products	49.76
10.74	General Merchandise	11.19
100.00		100.00

The Gross Earnings for the year show a slight falling off as compared with last year. Taking into consideration, however, the unsettled political conditions which have obtained throughout the Republic during the last five months of the fiscal year, the results can only be considered as remarkable and evidencing the wonderful vitality of the country. Notwithstanding that the earnings for the first six months of 1910-1911 were eminently satisfactory, we were able to show notable increases in the same period of the present fiscal year. On the other hand, however, our earnings for the last

six months fell off very noticeably, and this accounts for the slight decrease in the year's figures. For details by months of the earnings your attention is invited to statement No. 6 as prepared by our General Auditor.

OPERATING EXPENSES.

Careful attention has been given the upkeep of that part of the property which has not been interfered with by the revolutionists and the physical condition is superior even to that at the close of the fiscal year ending June 30, 1911.

As will be seen from the details subsequently given in this report, considerable work in the way of improving our track has been done during the year, additional heavy rail having been laid, more line ballasted, and temporary bridges replaced by permanent structures.

The percentage of Operation to Earnings during the year was 62.55 per cent., comparing favorably with the figure of last year of 63.42 per cent., and which, when consideration is given the heavy burden thrown upon the Operation by reason of the revolution, should be a source of satisfaction to the shareholders.

The Sub-Accounts for the fiscal years 1910-1911 and 1911-1912 compare as follows:

1910-11. Percentage.		1911-1912. Percentage.
28.42	Maintenance of Way and Structures	29.51
22.37	Maintenance of Equipment	25.20
43.64	Conducting Transportation	40.16
5.57	General Expenses	5.13
100.00		100.00

The comparative percentage to Gross Earnings for the two years being:

1910-11. Percentage.		1911-1912. Percentage.
18.02	Maintenance of Way and Structures	18.46
14.19	Maintenance of Equipment	15.76
27.68	Conducting Transportation	25.12
3.53	General Expenses	3.21
63.42		62.55

STATEMENTS OF OPERATIONS.

Attached to this report will be found the various statements of accounts as prepared by the General Auditor. Same give in detail the results for the year as well as financial position of the Company.

As heretofore, the books and accounts have been audited by Messrs. Price, Waterhouse & Company, of London, New York and Mexico, and a copy of their certificate as to the correctness thereof accompanied this report.

The results of operation for the year are as follows:

1910-1911. Mexican Silver.		1911-1912. Mexican Silver.	Percentage of Increase or Decrease.
$61,934,421.05	Gross Earnings	$61,447,790.71	
39,279,344.57	Operating Expenses	38,435,254.74	
$22,655,076.48	Net Earnings	$23,012,535.97	
	Which, reduced to *gold* at the average price of the Mexican dollar for the year viz., 50 cents, equals		
$11,327,538.24	*gold*	*$11,506,267.99*	
63.42	Operating percentage	62.55	Dec. 0.87
19,833,846	Kilometers run by revenue trains	17,974,817	" 10.34
3.1227	Gross Earnings per revenue train kilometer	3.4186	Inc. 8.65
1.9804	Operating Expenses per revenue train kilometer	2.1383	" 7.33
1.1423	Net Earnings per revenue train kilometer	1.2803	" 10.78
6,275.94	Gross Earnings per kilometer of road operated	6,355.49	" 1.25
3,980.26	Operating Expenses per kilometer of road operated	3,975.32	Dec. 0.12
2,295.68	Net Earnings per kilometer of road operated	2,380.17	Inc. 3.55
6.55209	Average amount received for each ton of freight	6.67312	" 1.81
.01818	Average receipts per ton per kilometer	.01867	" 2.62
1.80069	Average amount received from each passenger	1.67340	Dec. 7.61
.01810	Average receipts per passenger per kilometer	.01789	" 1.17

Expressed in miles the figures show as follows:

1910-1911. Mexican Silver.		1911-1912. Mexican Silver.	Percentage of Increase or Decrease.
12,324,157	Miles run by revenue trains	11,169,012	Dec. 10.34
$5.0254	Gross Earnings per revenue train mile	$5.5016	Inc. 8.65
3.1872	Operating Expenses per revenue train mile	3.4412	" 7.38
1.8382	Net Earnings per revenue train mile	2.0604	" 10.78
10,100.18	Gross Earnings per mile of road operated	10,228.10	" 1.25
6,405.62	Operating Expenses per mile of road operated	6,397.62	Dec. 0.12
3,694.56	Net Earnings per mile of road operated	3,830.48	Inc. 3.55
6.55209	Average amount received for each ton of freight	6.67312	" 1.81
.02926	Average receipts per ton per mile	.03004	" 2.62
1.80069	Average amount received from each passenger	1.67340	Dec. 7.61
.02912	Average receipts per passenger per mile	.02879	" 1.17

IMPROVEMENTS TO PROPERTY.

ADDITIONS AND BETTERMENTS:

From the organization of the Company to the close of the fiscal year under review, we have spent on additions and betterments the sum of $21,860,374.92, Mexican Currency, of which amount $2,771,920.10 was expended by us during this fiscal year.

The particulars of the expenditures during the year are shown in the following statement:

		Mexican Currency Expended July 1, 1911, to June 30, 1912.
Right of Way and Station Grounds		$28,454.30
Real Estate, Purchase of Land at Santiago, Mexico, D. F.		20,975.42
Protection of Banks and Drainage		38,280.06
Grade Reductions and Changes of Line		23,103.95
Tunnel Improvements		110,360.09
Bridges, Trestles and Culverts		282,506.31
Increased Weight of Rail		906,143.29
Ballast		673,601.30
Sidings and Spur Tracks:		
Total Amount Expended	$227,797.88	
Less: Value of Sidings Taken Up	49,427.00	
		178,370.88
Terminal Yards		81,492.09
Improvements of Crossings, Over and Under Grade		1,109.02
Interlocking Apparatus		3,214.96
Telegraph and Telephone Lines		2,491.76
Station Buildings and Fixtures:		
Total Amount Expended	$134,283.46	
Less: Stations Destroyed and Not Replaced	6,538.39	
		127,745.07
Roadway Buildings		2,443.93
Shops, Enginehouses and Turntables:		
Total Amount Expended	$303,528.87	
Less: Buildings Destroyed and Not Replaced	3,000.00	
		300,528.87
Shops, Machinery and Tools:		
Total Amount Expended	$169,737.06	
Less: Value of Machinery Worn Out or Discarded	47,724.00	
		122,013.06
Water and Fuel Stations		170,119.04
Electric Light and Power Plants		990.77
Additional Equipment		46,578.10
Freight Cars	$13,262.35	
Work Equipment	33,315.75	
Other Additions and Betterments		4.69
Change of Line and Change of Gauge between Acámbaro and Uruápan		97,274.23
Tramline between Tecajete and Hacienda de Los Arcos		3,312.29
Preliminary Survey between Honey and Gulf Coast Line		18,156.10
Sundry Betterments Expenditures pending Formal Authorization		200,700.78
		$3,439,970.36
Less:		
Adjustments of Charges, Delayed Credits, etc., for Previous Year:		
Gas Plants	$2,921.84	
Equipment	62,792.60	
Locomotives	$48,717.72	
Passenger Coaches	14,074.88	
Connection between Anhelo and Paredón	147.66	
Allende-Las Vacas Line	147.20	
Less:		
Floating Equipment, Sale of Tug "Colima"	42,557.98	
Sale of Tulancingo Tramways	6,000.00	
		$114,567.28
		$3,325,403.08
Less: Reserve to Cover Debit to Additions and Betterments that may later be transferred to Operating Expenses		553,482.98
		$2,771,920.10

BRIDGES, TRESTLES AND CULVERTS:

Permanent structures were erected during the year as follows:

Aguascalientes Division:

One 10.46 meter through plate girder span on masonry. Bridge 396-B.

One 5.18 meter "I" beam span, two on each side, on masonry. Bridge 469-B.

Cardenas Division:

Sixty-nine 4.57 meter "I" beam spans on masonry placed at various points on the Main Line.

One 4.57 meter "I" beam span, consisting of six stringers, on masonry. Bridge 291-A.

Eleven 5.18 meter "I" beam spans on masonry at various points on the Main Line.

Two 7.01 meter "I" beam spans on masonry. Bridge 268-B.

Eight 4.27 meter "I" beam spans on masonry placed in Main Line.

Three 3 meter arch culverts in place of "I" beams. Bridge 293-B.

Three 5.03 meter "I" beam spans on masonry. Bridges 308-A, 308-C and 310-D.

Two 4.88 meter spans, stringers on masonry. Bridges 311-A and 314-B.

Five bridges consisting of one span, three spans, two spans and two of one span each, respectively, of 6.17 meter "I" beams on masonry. Bridges 317-A, 335-A, 339-A, 344-A and 414-B.

Two bridges consisting of four and five 9.14 meter deck plate girder spans, respectively, on masonry and piers. Bridges 318-A and 323-A.

Two 17.07 meter deck plate girder spans on masonry. Bridges 431-A and 437-A.

One 3 meter arch culvert in place of through plate girder span. Bridge 530-A.

One 13.41 meter deck plate girder span. Bridge 531-A.

One 21.33 meter through plate girder span. Bridge 532-A.

One 13.71 meter through plate girder span. Bridge 533-A.

One span consisting of 18 rails of 37.204 kilograms per lineal meter (83-lb.). Bridge 536-A.

One .965 meter arch culvert in place of 3.048 meter rail span. Bridge 537-B.

Two 9.14 meter "I" beam spans on masonry. Bridges 560-A and 561-A.

Six bridges of 9.14 meter "I" beam spans on masonry with center pier. Bridges 581-A, 583-A, 598-A, 601-A, 602-A and 605-A.

Three bridges of 9.75 meter "I" beam spans on masonry supported by one new pier each. Bridges 643-A, 643-B and 646-B.

In addition to the foregoing, bridges 481-A, 526-A, 551-A and 665-A, referred to in last year's report, were duly completed during the year under review.

Guadalajara Division:

In the Guadalajara Yard, wooden stringers are being replaced with "I" beams and rail girders on masonry. Work 50 per cent. completed at June 30, 1912.

Ameca Branch: Two spans of 24.84 meter deck plate girders on masonry. Bridge 41-A.

Mexico Terminal:

One 10.06 meter deck plate girder span on masonry. Bridge 9-E, Cintura Line.

Mexico-Queretaro Division:

Two 3.05 meter "I" beam spans on masonry. Bridges 0-78 and 0-89-A.

In addition to the above, bridges 0-87-A and 0-88-A mentioned in last year's report were completed during the year ended June 30, 1912.

Monclova Division:

Ten 2 meter arch culverts were put in, in place of timber trestles at bridges B-1-B, B-1-C, B-G and B-1-E on Main Line, and three sidings.

Two 9.14 meter deck plate girder spans on masonry abutments and one pier. Bridge B-127-A.

Two 15.24 meter through plate girders on masonry. Bridge 134-A.

Two 4 meter arch culverts put in, in place of timber trestles. Bridge 135-A.

Two 3 meter arch culverts in place of timber trestles. Bridge 136-A.

Three 24.38 meter through plate girders on masonry abutments and two piers. Bridge 171-A.

Six 2 meter arch culverts replacing timber trestles. Bridges 172-A, 262-B, and 264-B, consisting of two arches each.

Two 9.14 meter deck plate girder spans on masonry abutments and one pier. Bridge 195-A.

Three 3.05 meter rail girder spans on masonry abutments and two piers. Bridge 264-A.

Two 5.18 meter "I" spans on masonry abutments and one pier. Bridge 269-A.

Three 5.18 meter "I" spans on masonry abutments and two piers. Bridge 269-B.

One 4 meter rail girder span. Bridge "E," Lampacitos Mine No. 4, Line.

Seven rail girder spans; two of 6.40 meters, one of 3.10 meters and four of 9.20 meters. Bridges A, B, E and F, Agujita Track, to Mine No. 7.

Northern Division:

One 5.18 meter "I" beam span on masonry. Bridge 928-A.
One 30.48 meter riveted truss span on masonry. Bridge 936-B.
One 17.07 meter deck plate girder span. Bridge 983-B.
One 7.01 meter "I" beam span. Bridge 984-B.
One 5.181 meter "I" beam span. Bridge 988-C.
One double arch culvert. Bridge 993-A.
One 5.18 meter "I" beam span. Bridge 1077-C.
One 13.41 meter deck plate girder span. Bridge 1116-A.
One 53.34 meter through pin connected truss span. Bridge 1119-B.

In addition to the foregoing, work on bridges 961-A, 986-A, 993-B, 993-C, 994-A, 994-B and 1117-A was completed during the year under review. These latter bridges were included in the report for last year.

San Luis Division:

Four 3.05 meter rail girder spans. Bridges 380-B, 448-A, 457-A and 464-A.

Masonry Boxes built at bridges 394-B, 395-C, 396-A, 396-B, 397-B, 458-A, 460-B and 468-A; also a rail and concrete box at bridge 461-A, to replace wooden boxes.

One double 3.05 meter "I" beam span in place of light girder span. Bridge 906-B.

Matehuala Branch: One double and one single 5.18 meter "I" beam spans. Bridges 658 and 864.

In addition to the above, a number of small wooden openings were replaced with masonry boxes and arches, and numerous bridges had masonry abutments raised and widened as well as being strengthened in other respects.

Torreon Division:

Two 3 meter semi-circular arch culverts to replace timber trestles. Bridges 639 and B.
Two 7.62 meter "I" beam spans on masonry. Bridges 640-A and B.
Three 7.62 meter "I" beam spans on masonry. Bridge 640-C.
Four 4.57 meter rail girder spans on masonry. Bridge 641-A.

PURCHASES OF NEW RAIL:

During the year we purchased 21,253 tons of 42.164 kilogram (85-lb. A. S. C. E.) rail and 14,000 tons of 37.204 kilogram (75-lb.) rail from native producers and 12,300 tons of 37.204 kilogram (75-lb.) rail of foreign manufacture.

The domestic rail is being used in replacements and renewals; the foreign rail in the construction of new lines.

Of the above we received from the home source in the course of the year all the 42.164 kilogram (85-lb. A. S. C. E.) rail, and 6,368 tons of the 37.204 kilogram (75-lb.) rail; from the foreign manufacturers, 9,415 tons.

RELAYING WITH HEAVIER RAIL:

This also has received serious consideration during the year, and in order to take care of increased business and to improve the track generally the following replacements of heavy for light rail have been made:

Aguascalientes Division:

From kilometer 584.064 to kilometer 585.600, a total of 1536 track meters of 27.779 kilogram (56-lb.) rail replaced with 37.204 kilogram (75-lb.) rail.

Cardenas Division:

From kilometer 322.070 to kilometer 382.809, and from kilometer 618.759 to kilometer 651.000, a total of 79.936 kilometers of 27.779 kilogram (56-lb.) rail, 11.165 kilometers of 32.739 kilogram (66-lb.) rail and 1.879 kilometers of 41.172 kilogram (83-lb.) rail replaced with 42.390 kilogram (85-lb. A. R. A.) rail.

From kilometer 291.963 to kilometer 309.070, or 7.727 kilometers of 32.739 kilogram (66-lb.) rail, and 9.380 kilometers of 41.172 kilogram (83-lb.) rail replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

From kilometer 418.550 to kilometer 438.462, and from kilometer 457.069 to kilometer 462.160, a total of 25.003 kilometers of 37.204 kilogram (75-lb.) rail, was replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

From kilometer 462.160 to kilometer 463.490, from kilometer 514.920 to kilometer 544.110, from kilometer 610.520 to kilometer 620.970 and from kilometer 661.440 to 667.000, a total of 46.530 kilometers, of which 40.979 kilometers were of 32.739 kilogram (66-lb.) rail and 5.560 kilometers of 41.172 kilogram (83-lb.) rail replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

From kilometer 413.400 to kilometer 418.550, or 5.150 kilometers of track of 37.204 kilogram (75-lb.) rail was replaced with 42.390 kilogram (85-lb. A. R. A.) rail.

At Rascón, San Dieguito, Micos, Rodriguez, Velasco, Auza, Escontría, La Labor, Espinazo, Las Canoas, Zacate, Cafetal, Tambaca, Las Crucitas, San Mateo, Valles and Cardenas sidings, a total of 16.784 kilometers of track of 27.779 kilogram (56-lb.) rail was replaced with 41.172 kilogram (83-lb.) and 37.204 kilogram (75-lb.) rail.

Guadalajara Division:

Between Guadalajara and Orendáin, Ameca Branch, and from Guadalajara Yard, 27.779 kilogram (56-lb.) rail to the extent of 14.501 kilometers was replaced with 34.723 kilogram (70-lb.) rail.

Manzanillo Line. Between Tuxpan and Zapotilic 0.725 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 37.204 kilogram (75-lb.) rail.

Gomez Palacio Division:

From kilometer 679.452 to kilometer 680.393 and from kilometer 704.925 to 705.492, a total of 1.508 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 32.739 kilogram (66-lb.) rail.

Mexico Terminal:

At this Terminal a total of 1.635 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 32.739 kilogram (66-lb.) rail.

1.380 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 37.204 kilogram (75-lb.) rail, and fourteen switches of 27.779 kilogram (56-lb.) were replaced with 37.204 kilogram (75-lb.) switches.

4.819 kilometers of 19.842 kilogram (40-lb.) rail replaced with 27.779 kilogram (56-lb.) rail.

Mexico-Queretaro Division:

From kilometer 234.190 to kilometer 237.648 and from kilometer 237.967 to kilometer 251.209, or 16.700 kilometers of 27.779 kilogram (56-lb.) rail, was replaced with 32.739 kilogram (66-lb.) rail.

Monclova Division:

From kilometer 0 to kilometer 1.368 the old 30.507 kilogram (61½-lb.) rail was replaced with 37.204 kilogram (75-lb.) rail.

Monterrey and Gulf Division:

From kilometer 75.000 to kilometer 79.640 or 4.640 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 34.723 kilogram (70-lb.) rail.

From kilometer 79.640 to kilometer 109.640, or 30.000 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 34.723 kilogram (70-lb.) rail.

From kilometer 16.040 to kilometer 19.640 and from kilometer 109.640 to kilometer 239.640, a total of 33.600 of 27.779 kilogram (56-lb.) rail replaced with 34.723 kilogram (70-lb.) rail.

From kilometer 239.640 to kilometer 245.000, or 5.360 kilometers of 27.779 kilogram (56-lb.) rail was replaced with 34.723 kilogram (70-lb.) rail.

From kilometer 247.407 to kilometer 435.242 there were taken up 2.388 kilometers of 27.779 kilogram (56-lb.) rail and replaced with 34.723 kilogram (70-lb.) rail, in order to set new switches.

Northern Division:

Matamoros Branch: From kilometer 180.000 to kilometer 242.000 there were taken up 53.648 kilometers of 19.842 kilogram (40-lb.) rail and 7.450 kilometers of 27.779 kilogram (56-lb.) rail, a total of 61.098 kilometers replaced with 32.739 kilogram (66-lb.) rail.

In order to avoid bumping near frogs (as these were already of 37.204 kilogram (75-lb.) rail, from kilometer 87 to kilometer 319, there were taken up 0.685 kilometers of 19.842 kilogram (40-lb.) rail and replaced with 37.204 kilogram (75-lb.) rail.

Pacific Division:

From kilometer 36.388 to kilometer 49.622 and from kilometer 49.888 to kilometer 63.510, or 26.856 kilometers of 22.322 kilogram (45-lb.) rail, was replaced with 27.779 kilogram (56-lb.) rail.

San Luis Division:

From kilometer 562.000 to kilometer 575.000, or 13.000 kilometers of 34.723 kilogram (70-lb.) rail was replaced with 62.164 kilogram (75-lb. A. S. C. E.) rail.

From kilometer 575.000 to kilometer 595.832, or 20.832 kilometers of 34.723 kilogram (70-lb.) rail was replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

From kilometer 595.832 to kilometer 603.832, or 8.000 kilometers of 34.723 kilogram (70-lb.) rail was replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

From kilometer 603.832 to kilometer 740.364, or 136.532 kilometers of 34.723 kilogram (70-lb.) rail was replaced with 42.164 kilogram (85-lb. A. S. C. E.) rail.

TAMPICO TERMINAL:

At this Terminal there were taken up a total of 12.722 kilometers of 27.779 kilogram (56-lb.) rail and replaced with 32.739 kilogram (66-lb.) rail.

BALLAST:

We have followed up our policy of gradually improving our track by the placing of permanent ballast on the following Divisions during the year:

DIVISIONS.	LINEAL METERS.
Aguascalientes	11,380
Cardenas	98,743
Guadalajara	45,707
Hidalgo	940
Mexico-Queretaro	75,293
Monclova	1,977
Monterrey	95,638
Northern	15,172
San Luis	35,700
Tampico Terminal	10,215
Total	390,774

NEW SIDE AND PASSING TRACKS:

During the year new side-tracks, passing tracks, cross-overs and extensions to existing side-tracks were built to the extent of 30.073 kilometers. The following statement gives detail of weight of rail used in these new tracks, viz.:

WEIGHTS OF RAIL.	KILOMETERS.
40 lb. rail (19.842 kilograms)	0.325
45 " " (22.322 ")	2.830
50 " " (24.802 ")	1.546
54 " " (26.786 ")	6.514
56 " " (27.779 ")	13.013
60 " " (29.763 ")	0.050

Weights of Rail.						Kilometers.
61½	"	"	(30.507	"	).....	0.368
65	"	"	(32.243	"	).....	0.452
66	"	"	(32.739	"	).....	0.327
70	"	"	(34.723	"	).....	1.366
75	"	"	(37.204	"	).....	3.008
85	"	"	(42.390	"	).....	0.274
						30.073

From which deduct—Tracks taken up:

40	lb.	rail	(19.842	kilograms)	.....	0.222
45	"	"	(22.322	"	).....	1.359
50	"	"	(24.802	"	).....	3.183
54	"	"	(26.786	"	).....	0.558
56	"	"	(27.779	"	).....	2.715
60	"	"	(29.763	"	).....	1.034
65	"	"	(32.243	"	).....	0.093
70	"	"	(34.723	"	).....	0.056
75	"	"	(37.204	"	).....	0.217
85	"	"	(42.390	"	).....	0.184
						9.621
Net increase						20.452

NEW TERMINAL STATION, SAN LUIS POTOSI:

At the present time the traffic originating at, destined to or passing through this important centre is handled at two terminals, *i. e.*, those of the Ex-National and X-Central. Both are inadequate for proper service, and in addition thereto cause unnecessary expense. A careful study of the matter having demonstrated the advantages to be derived from the construction of an up-to-date terminal, plans therefor were drawn and the works begun during the fiscal year under review.

NEW STATIONS:

We completed during the year the construction of Station Buildings at the following places:

Passenger Station at Iguala.
Freight Station at Iguala.
Passenger and Freight Station at Balsas.
Passenger Station at Cuernavaca.
Passenger Station at Colima.
Passenger Station at Aguascalientes.
Freight Station at Linares.

Thirteen sets of new Section Houses for the use of our track employees were also built in the course of the year.

PURCHASE OF NEW EQUIPMENT:

Orders were placed during the year for ten first-class coaches; thirteen second-class and ten baggage, mail and express cars. Also for 150 tank-cars 12,000 gallons, 100,000 lbs. capacity. All for delivery during the latter months of this calendar year.

CONSTRUCTION OF NEW LINES:

Durango to Llano Grande:

Due to unexpected difficulties encountered in the construction of this line, same has not as yet been fully completed. It is now expected, however, that the line will be finished and put in operation about the month of December next; 54.450 kilometers are now being operated. As of June 30, 1912, the amount expended on this construction was $3,966,904.06, Mexican currency.

Durango to Cañitas:

The building of this line has been carried on actively during the year. Practically all the grading and masonry work on the 160 kilometers out of Durango mentioned in last report has been completed, the percentage being, respectively, 99.83 and 99.57, while 64 per cent. of the rails have been laid.

The contract for the balance of the line, approximately 114 kilometers, was executed on April 2, 1912, and work commenced May 6. As of June 30, 13.3 per cent. of the grading and 3 per cent. of the masonry had been done. If no unforeseen difficulties are experienced, it is hoped to put the line in operation by April, 1913. To June 30, 1912, we had expended on this work $3,051,796.58, Mexican currency.

Penjamo to Ajuno:

The same remarks apply to the construction of this line. Subsequent to June 30, however, the work was seriously interfered with for some two or three weeks by very heavy floods in the section which the line traverses. Eighty per cent. of the grading and masonry was finished as of June 30, last. Unless unlooked for obstacles arise, the line should be ready for operation by December this year. The expenditures to June 30, 1912, amounted to $2,969,408.65, Mexican currency.

Allende to Las Vacas:

Under concession granted by the Federal Government on March 2, 1912, a contract for the construction of this line was let on April 12, 1912. The line runs from Allende in the State of Coahuila on the old Mexican International Road, to Las Vacas on the Rió Grande, opposite Del Rio, Texas, and will connect with the line of the Kansas City, Mexico & Orient Railway, now under construction. The total length of the line is 118 kilometers, or 73.32 miles, of which, however, it is now proposed to build but 80 kilometers, or 49.71 miles, to the Haciendo of San Carlos.

The line runs through a good agricultural country, susceptible of considerable development. Already several irrigation projects are under way. It is confidently expected that this line will prove a valuable feeder to the system. Eight per cent. of the grading has been completed at June 30th last. The amount expended to the close of the fiscal year was $57,638.39, Mexican currency.

Matamoros to San Francisco:

On March 2, 1912, a contract was executed with the Federal Government of Mexico covering the construction of this coast line, which will have an approximate total length of 902 kilometers, or 560.48 miles. In accordance with the stipulations in the contract 100 kilometers of said line must be completed in two years from the signing thereof, and 100 kilometers in each succeeding year. The whole line to be completed within ten years. Careful study and consideration having demonstrated the advisability of constructing that portion of the said line from Tampico south, the contract for the building of the first one hundred kilometers from that point was executed on June 5th last.

It is fully expected that this section of the line will prove to be a source of considerable net revenue to the Company, inasmuch as it will tap the major part of the oil fields in that region, as well as a good agricultural country.

IN GENERAL.

EMPLOYEES:

At June 30, 1912, there were 31,179 employees in the service of the Company, of which number 639, or 2.05 per cent., were foreigners.

The diminution in the number of foreign employees is principally due to the voluntary separation from our service, in April last, of the major part of the foreign trainmen.

STATEMENTS OF EQUIPMENT:

Accompanying this report are the usual statements of Locomotives and Cars on hand at the close of the fiscal year. It will be noted that we have suffered severely in the loss of cars through the activities of the revolutionists.

EXPRESS SERVICE:

The operations of the Campañía Mexicana de Express, S. A., for the year have been more satisfactory, having regard in this connection also to the disturbances to business through uncertain conditions.

FUEL OIL:

The benefits which we expected to derive from the substitution of oil for coal as fuel have been fully borne out by the year's results, as will be noted from the decrease in cost of fuel shown in Statement No. 7, of the General Auditor.

It is, of course, economically impossible for us to use oil exclusively on our system, bearing in mind the long distances in some cases from the source of supply, and the proximity of coal in those districts. Where we have found it economical to use oil, same is being used. Of the total mileage of the system, approximately 50 per cent. is operated by oil and 50 per cent. by coal.

NEW TERMINAL STATION, MEXICO CITY:

Since the organization of the Company, the advisability of constructing a Terminal Station in the City of Mexico sufficient in size to accommodate all our Passenger and Freight business for years to come, has been given the careful consideration of the operating officers, and plans therefor have been drawn, and approved by the Board of Directors. No work has as yet been done in this connection, but the preliminary details are well advanced and the construction can be commenced as soon as the opportune time arrives.

PARALLEL LINES:

One of the considerations weighing in the merger of the Companies now forming this Company was the suppression of certain lines, principally of the old National Railroad Company and the old Mexican Central Railway Company, which parallel each other, the traffic of the region not being sufficient to sustain both tracks.

After careful and mature deliberation the Committee appointed to investigate the matter recommended the abandonment of the following lines:

		Kilometers.	Miles.
Mexican International	Anhelo to Ixtla	21.00	13.05
"	Horizonte to Bermejillo	22.53	14.00
"	Sauceda to Matamoros	210.00	130.49
National R. R.	Saltillo to K. 931	17.00	10.56
"	Jarita to Columbia	32.00	19.88
Mexican Central R. R.	Tepenacasco to Tularcingo	7.00	4.35
"	Cuyamaloya to K. 155 (Pánuco)	36.00	22.37
"	Hercules to Adjuntas	15.00	9.32
"	San Luis to Estanzuela	9.00	5.59
"	Sandoval to Somoriel	20 00	12.43
Coahuila & Pacific	Encantada to Saltillo	22.00	13.67
"	Agua Naval to Torreón	10.00	6.21
Hidalgo Railway	K. 15 (near Tultepéc Station) to Mogotes	43.00	26.72
		464.53	288.64

In accordance with the provisions of Section 22 of Article V, of our mortgages, the consent to the suppression of the concessions covering the said lines was requested, and received. The Department of Communications and Public Works having also signified its approval thereto, the necessary steps are now being taken looking to the said abandonment. It is confidently expected that same will benefit the property very materially by reduction of expenses.

OIL INDUSTRY:

Considerable impetus has been given to the development and production of oil in the Tampico and Tuxpan districts during the past year. New wells have been sunk in numerous places with gratifying results, while the old wells keep on producing as satisfactorily as heretofore. In all it is now computed that there are forty organized companies engaged in developing this industry, and the handling of the output should bring good results to the Company as soon as the line now being built south from Tampico is completed. The prospects of this business for the future look very promising.

CROPS:

It is with regret that I have to advise that the outlook for the present crops is not at all satisfactory. The unusually heavy rains throughout the agricultural belt have had a very damaging effect, and as a consequence the yield is now expected to be below normal.

STATEMENTS OF ACCOUNTS:

Accompanying this report I hand you a letter from the General Auditor, dated September 6, 1912; as also the ten statements of accounts as enumerated therein. A list of the Directors and Officers of the Company as at the close of the fiscal year is attached hereto..

Respectfully submitted,

E. N. BROWN,
President.